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Table 24 percentile column headings aligned correctly 6/30/2010

2000 CDC Growth Charts for the United States: Methods and Development

Vital and Health Statistics
Series 11, Number 246
May 2002

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention • National Center for Health Statistics

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2000 CDC Growth Charts for the United States: Methods and Development

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

Hyattsville, Maryland
May 2002
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National Center for Health Statistics

Edward J. Sondik, Ph.D., *Director*

Jack R. Anderson, *Deputy Director*

Jack R. Anderson, *Acting Associate Director for International Statistics*

Jennifer H. Madans, Ph.D., *Associate Director for Science*

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Vicki L. Burt, Sc.M., R.N., *Chief Planning Branch*

Lewis Berman, M.S., *Chief Information Management Branch*

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Phil Batty
Center for Health Information Management and Epidemiology
State of Missouri Department of Health
Jefferson City, MO

Fred Buhr
Center for Health Statistics
State of Wisconsin Department of Health and Family Services
Madison, WI

Margaret Carroll
National Center for Health Statistics
Centers for Disease Control and Prevention
Hyattsville, MD

John Chang
Computer Information Systems and Support Services
Nova Research Company
Bethesda, MD

Chris Cronk
Center for Health Statistics
State of Wisconsin Department of Health and Family Services
Madison, WI

William Davis
Klemm Analysis Group, Inc.
Washington, DC

Catherine Duran
National Center for Health Statistics
Centers for Disease Control and Prevention
Hyattsville, MD

Odell Eldridge
Computer Information Systems and Support Services
Nova Research Company
Bethesda, MD

Stephen Sloan
National Center for Health Statistics
Centers for Disease Control and Prevention
Hyattsville, MD

Christine Zeller
Department of Community Health
Wright State University
Yellow Springs, OH

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Abstract

Objectives

This report provides detailed information on how the 2000 Centers for Disease Control and Prevention (CDC) growth charts for the United States were developed, expanding upon the report that accompanied the initial release of the charts in 2000.

Methods

The growth charts were developed with data from five national health examination surveys and limited supplemental data. Smoothed percentile curves were developed in two stages. In the first stage, selected empirical percentiles were smoothed with a variety of parametric and nonparametric procedures. In the second stage, parameters were created to obtain the final curves, additional percentiles and z-scores. The revised charts were evaluated using statistical and graphical measures.

Results

The 1977 National Center for Health Statistics (NCHS) growth charts were revised for infants (birth to 36 months) and older children (2 to 20 years). New body mass index-for-age (BMI-for-age) charts were created. Use of national data improved the transition from the infant charts to those for older children. The evaluation of the charts found no large or systematic differences between the smoothed percentiles and the empirical data.

Conclusion

The 2000 CDC growth charts were developed with improved data and statistical procedures. Health care providers now have an instrument for growth screening that better represents the racial-ethnic diversity and combination of breast- and formula-feeding in the United States. It is recommended that these charts replace the 1977 NCHS charts when assessing the size and growth patterns of infants, children, and adolescents.

Keywords: *growth charts • height • length • weight • body mass index • head circumference • NHANES*

2000 CDC Growth Charts for the United States: Methods and Development

Robert J. Kuczmarski, M.S.P.H., M.P.H., R.D., Dr.P.H., Division of Digestive Diseases and Nutrition, National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health; Cynthia L. Ogden, M.R.P., Ph.D., Division of Health Examination Statistics; Shumei S. Guo, M.S., Ph.D.,Center for Lifetime Health Research, School of Medicine, Wright State University; Laurence M. Grummer-Strawn, M.A., M.P.A., Ph.D., Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion; Katherine M. Flegal, M.S., M.P.H., Ph.D., Division of Health Examination Statistics; Zuguo Mei, M.P.H., M.D., Division of Nutrition and Physical Activity, National Center for Chronic Disease Prevention and Health Promotion; Rong Wei, M.S., Ph.D., Office of Research and Methodology; Lester R. Curtin, Ph.D., Office of Research and Methodology; Alex F. Roche, M.D., Ph.D., D.Sc., F.R.A.C.P., Center for Lifetime Health Research, School of Medicine, Wright State University; Clifford L. Johnson, M.S.P.H., Division of Health Examination Statistics

Introduction

The National Center for Health Statistics (NCHS) growth charts that have been in use since 1977 have been revised. The revised version, known as the Centers for Disease Control and Prevention (CDC) Growth Charts: United States released in 2000, is recommended for use in clinical practice and research to assess size and growth in U.S. infants, children, and adolescents (1).

The 2000 CDC Growth Charts consist of a set of charts for infants, birth to 36 months of age and a set of charts for children and adolescents from ages 2 to 20 years. The charts for infants include sex-specific smoothed percentile curves for weight-for-age, recumbent length-for-age, head circumference-for-age, and weight-for-recumbent length; the charts for children and adolescents include weight-for-age, stature-for-age, and body mass index (BMI)-for-age curves. The BMI-for-age charts represent a new tool that can be used by health care providers for the early identification of children who are at risk for becoming overweight at older ages. The 2000 CDC Growth Charts also include weight-for-stature charts for statures ranging from 77 to 121 cm, primarily intended for use among children from ages 2 to 5 years. A listing of the 1977 NCHS charts and the 2000 CDC charts is shown in table A.

Historical Background

Anthropometric data are valuable objective indicators of attained size and physical growth in children. A variety of growth references were developed and used in the United States since the early 1900s. Most of these earlier references have considerable limitations, including lack of coverage for infants and preschool children and limited

representation of ethnic, genetic, socioeconomic, environmental, and geographic variability (2). From 1946–1976, the Stuart/Meredith Growth Charts were widely used. These charts were derived from stature and weight measurements taken on white children living near Iowa City, Iowa, or in Boston, Massachusetts, from 1930 to 1945 (3). The sample sizes were relatively small and the smoothed percentile lines were reportedly based on mathematical approximations of curves smoothed by hand (4). Thus, the data did not represent the diversity of children residing in the United States and statistical curve-fitting procedures were not used.

The impetus for the development of the 1977 NCHS Growth Charts began in 1971, when a study group sponsored by the American Academy of Pediatrics and the Maternal and Child Health Program of the Bureau of Community Health Services, U.S. Public Health Service, recommended new growth charts, based on data from the NCHS Health Examination Surveys, for the clinical assessment of infants and children (5). Subsequently, in 1974, the Food and Nutrition Board of the National Academy of Sciences made similar recommendations, emphasizing the need for new growth charts for infants and children based on nationally representative survey data, to be supplemented with data collected from infants in the Fels Longitudinal Growth Study (6). These recommendations were further supported in 1975 by a study group sponsored by the National Institute of Child Health and Human Development, National Institutes of Health (7).

Growth charts for the United States were developed by NCHS when nationally representative cross-sectional survey data became available for most of the pediatric age range (8). Data from the National Health Examination Survey (NHES) II (1963–65) for ages 6–11 years, NHES III (1966–70) for ages 12–17 years, and the first National Health and Nutrition Examination Survey (NHANES) I (1971–74) for ages 1–17 years were used to develop these charts. National survey data were not available for the period from birth to 1 year. Therefore, the national survey data were supplemented with data from the longitudinal growth study of the Fels Research Institute in Yellow Springs, Ohio. To avoid pooling multiple diverse data sets in the 1977 NCHS charts for birth to 3 years, the infant charts were based solely on the Fels data. The 14 sex-specific growth charts developed for infants birth to age 36 months and older children from ages 2 to 18 years are generally referred to as the 1977 NCHS Growth Charts (2,8,9).

Table A. Charts included in the 1977 NCHS Growth Charts and in the 2000 CDC Growth Charts

1977 NCHS Growth Charts*	2000 CDC Growth Charts*
Weight-for-age Birth to 36 months 2 to 18 years	Weight-for-age Birth to 36 months 2 to 20 years
Length-for-age Birth to 36 months	Length-for-age Birth to 36 months
Weight-for-length Birth to 36 months Boys (49 to 103 cm) Girls (49 to 101 cm)	Weight-for-length Birth to 36 months Boys (45 to 103 cm) Girls (45 to 103 cm)
Head circumference-for-age Birth to 36 months	Head circumference-for-age Birth to 36 months
Stature-for-age 2 to 18 years	Stature-for-age 2 to 20 years
Weight-for-stature** Boys (90 to 145 cm) Girls (90 to 137 cm)	Weight-for-stature** Boys (77 to 121 cm) Girls (77 to 121 cm)
	BMI-for-age 2 to 20 years

*All charts are sex-specific.

**The 1977 charts are applicable to boys with stature from 90 to 145 cm *and* age under 11.5 years, and to girls with stature from 90 to 137 cm *and* under 10.0 years of age. They are not applicable for any child showing the earliest signs of pubescence. The revised charts have no similar age or pubescence restrictions. Although the revised charts were developed for children 2 to 5 years of age, in practice they may accommodate some shorter children with chronologic ages 5.0 years and over.

In 1978 CDC produced a normalized version of the NCHS curves (10,11). The World Health Organization (WHO) subsequently recommended these normalized charts for international applications (12–14). These normalized versions of the 1977 charts are thus sometimes referred to as the NCHS/WHO, CDC/WHO, or NCHS/CDC/WHO growth charts. Following the recommendation of Waterlow, et al., this version enabled the expression of body measurements in terms of standard deviations from the median or z-scores (15). Z-scores facilitate comparisons across ages and allow the mean and standard deviation to be calculated for a group of measures. Another advantage of the normalized charts was the ability to describe the relative status of children at extremes of the distributions.

Although the normalized charts allowed users a means to better quantify growth at the extremes, normalization does not refer to an improved instrument to qualify growth as "normal" or as a "standard" for growth. Both the 1977 smoothed percentiles and the 1978 normalized growth curves are growth references. They allow the growth status of a child, or a group of children, to be compared with that of a reference population. The 1978 normalized curves are similar to, but not identical with the 1977 smoothed percentiles.

Concerns Surrounding the 1977 Charts

Since the development of the 1977 NCHS Growth Charts, a number of concerns have been raised about various aspects of the charts and the procedures used in their development (10,16–23). Most of these concerns centered on the infant charts and were largely associated with characteristics of the Fels data. The Fels data came from a single longitudinal study of mainly formula-

fed, white middle-class infants in a limited geographic area of southwestern Ohio, collected 1929–75. In addition to not being from a nationally representative sample, the Fels observations were made at birth and 1 month, at 3-month intervals from 3 to 12 months, and at 6-month intervals from 12 to 36 months. These intervals may be inadequate to properly identify growth patterns during periods of rapid change. The Fels birthweights may not match more recent national birthweight distributions, and differences between recumbent length and stature may have been too large, suggesting limitations in the recumbent length data. Moreover, size and growth patterns of Fels infants may not adequately represent current growth patterns of combined breast- and formula-fed infants in the population (8,18,19,21,22). In addition, differences between the recumbent length measurements for infants from the Fels data and the stature measurements from the NCHS data sets lead to inconsistent percentile estimates from the 1977 charts when the transition is made from recumbent length to stature between 24 and 36 months of age. Other concerns included the limited ability to assess size and growth at extremes beyond the 5th and 95th percentiles, the absence of weight-for-stature references for adolescents, and the inability to assess growth at ages 18 years and over (16).

The Revision

The 1977 charts were revised in part because more recent and comprehensive national data on body measurements in U.S. children were available. After the 1977 NCHS Growth Charts were developed, additional national survey data became available from the NHANES II (1976–80) beginning at 6 months of age, and from the NHANES III (1988–94) beginning at 2 months of age (24,25). During the planning of NHANES III, increasing awareness of the concerns surrounding the 1977 NCHS Growth Charts influenced the decision to oversample children ages 2 months to 6 years.

The objective of the revision process was to use improved statistical smoothing procedures, in conjunction with more comprehensive national survey data, to provide a better instrument for health care providers who evaluate the growth status of children in the United States (16). The Advance Data report summarizing the development of the revised growth charts was issued in 2000 (1). The present report is designed to expand on the content of the initial report and provide more detailed information on the development of the revised CDC growth charts for the United States, including the process, the data sources, the statistical procedures that were followed, and the results of statistical evaluations for the revised charts.

Methods

Data Sources

The source of data for each growth chart is shown in table B. The primary and supplemental data sources are summarized in table C. Detailed sample sizes for the data used to create each chart, stratified by age, sex, and data source, are shown in detailed tables 1–8.

National Data

The revised growth curves for the United States were developed with data collected by NCHS in five cross-sectional, nationally representative health examination surveys (table C): the NHES II (1963–65) and III (1966–70), and NHANES I (1971–74),

Table B. Source of data for each growth chart

Chart	Age (months) or height (cm) range	Primary data sources[1]	Supplemental data sources
Weight-for-age	Birth to 36 months	National surveys 3–5[2]	National birth certificate data from United States Vital Statistics[2]
Length-for-age	Birth to 36 months	National surveys 3–5[2,3]	Birth certificate data from Wisconsin and Missouri State vital statistics[2,4]; CDC Pediatric Nutrition Surveillance System data for 0.5, 1.5, 2.5, 3.5, and 4.5 months[2]
Head circumference-for-age	Birth to 36 months	National surveys 3–5[2]	Fels Longitudinal Study data[2]
Weight-for-length	45 to 103 cm	National surveys 3–5[2,5]	Birth certificate data from Wisconsin and Missouri State vital statistics[2]
Weight-for-stature	77 to 121 cm	National surveys 3–5[5]	None
Weight-for-age	24 to 240 months	National surveys 1–5[5]	None
Stature-for-age	24 to 240 months	National surveys 1–5	None
BMI-for-age	24 to 240 months	National surveys 1–5[5]	None

[1]Survey 1 = NHES II, Survey 2 = NHES III, Survey 3 = NHANES I, Survey 4 = NHANES II, and Survey 5 = NHANES III.
[2]Excludes birthweight <1,500 gm.
[3]Excludes data from NHANES III for ages <3.5 months.
[4]Wisconsin and Missouri were the only states with available data from birth certificates.
[5]Excludes data from NHANES III for ages ≥72 months.

II (1976–80), and III (1988–94). The survey designs are based on stratified, multistage probability samples of the civilian, noninstitutionalized population in the 48 contiguous States (NHES II, NHES III, NHANES I) or all 50 States (NHANES II, NHANES III). All surveys consisted of a home interview and a standardized physical examination conducted in a mobile examination center. Age was calculated as age at the time of examination when the anthropometric data were recorded. Children ages 6–11 years from NHES II, 12–17 years from NHES III, 1–19 years from NHANES I, six months–19 years from NHANES II, and 2 months–19 years from NHANES III were included in the revision. The small number of children in NHES II who had their 12th birthday after the home interview and before the examination and those who had their 18th birthday after the home interview and before the examination in NHES III were also included. Although the revised growth charts for older children were developed for ages from 2 to 20 years, additional NHANES data for individuals younger than 2 years and older than 20 years were included in the analysis to improve estimates at the lower and upper boundaries (table C). Detailed descriptions of these surveys have been provided (25–29).

Anthropometric procedures developed for NHANES III are documented on videotape URL: http://www.cdc.gov and in the NHANES III procedures manual (30). The procedures were consistent with published recommendations for standardized anthropometric techniques (31). The NHANES III measurement techniques for weight, recumbent length, stature, and head circumference were based on procedures used in the previous NHES and NHANES surveys, and either the same or comparable measuring equipment was used across the surveys.

Supplemental Data

For the infant charts, a limited number of additional data points

Table C. Primary and supplemental data sources

Data set	Years	Data source	Subject[1]	Sex	Chart[2]
Primary data sets					
NHES II	1963–65	National survey	Age (months): 72.0–145.9	M, F	W, S, BMI
NHES III	1966–70	National survey	Age (months): 144.0–217.9	M, F	W, S, BMI
NHANES I	1971–74	National survey	Age (months): 12.0–23.9	M, F	L
			12.0–35.9	M, F	HC
			12.0–281.9	M	W
			12.0–245.9	F	W
			18.0–305.9	M, F	S, BMI
			Length (cm): 65–109		WL
			Stature (cm): 77–127		WS
NHANES II	1976–80	National survey	Age (months): 6.0–35.9	M, F	L, HC
			6.0–281.9	M	W
			6.0–245.9	F	W
			18.0–305.9	M, F	S, BMI
			Length (cm): 65–109		WL
			Stature (cm): 77–127		WS
NHANES III	1988–94	National survey	Age (months): 3.0–35.9	M, F	L
			2.0–35.9	M, F	HC
			2.0–71.9	M, F	W
			18.0–305.9[3]	M, F	S
			18.0–71.9[3]	M, F	BMI
			Length (cm): 65–109		WL
			Stature (cm): 77–127		WS
Supplemental data sets					
United States Vital Statistics	1968–80; 1985–94	Birth certificates	Age: birth	M, F	W
State of Wisconsin Vital Statistics	1989–94	Birth certificates	Age: birth	M, F	L
			Birth length (cm): 45–52.9		WL
State of Missouri Vital Statistics	1989–94	Birth certificates	Age: birth	M, F	L
			Birth length (cm): 45–52.9		WL
Fels Longitudinal Study	1960–94	Hospital records[4]	Age: birth	M, F	HC
Pediatric Nutrition Surveillance System[5]	1975–95	Clinic records	Age (months): 0.1–4.9	M, F	L

[1]Data from outside the 2 to 20-year range for the child/adolescent charts were used to improve estimates at the upper and lower age boundaries. Subject ages, shown for growth chart variables, reflect the endpoints of age ranges for data actually used to construct the smoothed percentile curves.

[2]W = weight-for-age; S = stature-for-age; BMI = body mass index-for-age; L = length-for-age; HC = head circumference-for-age; WL = weight-for-length; WS = weight-for-stature.

[3]Lengths at ages 18.0–23.99 months, and stature at all other ages.

[4]Majority measured in hospital by Fels staff.

[5]Selected clinics.

obtained from other sources were incorporated at birth and during the first few months of life where national data were either not available or were insufficient (table C). The infant weight-for-age curves included national birthweight distributions taken from birth certificates for more than 83 million infants born in the United States between 1968–80 and 1985–94, corresponding to years in which infants in the national surveys were born. Birth length data were only available from two States, Wisconsin and Missouri. These States recorded this information on birth certificates for 890,000 infants born between 1989 and 1994. These data were used in the development of the length-for-age and weight-for-length curves. Additionally, a limited amount of data from the CDC Pediatric Nutrition Surveillance System (PedNSS) was used in the length-for-age charts. The majority of infant data in the PedNSS system come from clinical records of the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) (20). Because the PedNSS data are not nationally representative, a subset of the PedNSS data collected from 1975 to 1995 was used. Clinics were selected for inclusion based on three specific conditions. First, the mean lengths and weights had to be within ±0.5 cm and ±0.5 kg of the mean from NHANES II and III combined for each single month of age from age 3 to 11 months. Second, the clinics had to have a SD within ±0.2 cm and ±0.2 kg of the SDs in the combined NHANES II and III. Finally, the skewness in weight distribution of the selected clinics' population had to be within ±0.3 kg of the skewness of weight in the combined NHANES II and III. A total of 213 PedNSS clinics were selected, resulting in a sample of 14,846 observations at 0.5 months, 8,825 at 1.5 months, 5,240 at 2.5 months, 1,640 at 3.5 months, and 2,258 at 4.5 months. All the matching procedures excluded subjects with birthweights <1,500 grams.

Head circumference at birth was not available from the national surveys or from birth certificates. Consequently, the head circumference-for-age curves included data for head circumference at birth from 362 infants in the Fels Longitudinal Study who were born between the years 1960 and 1994, corresponding to the national surveys. Most of these data were recorded in hospitals by the Fels staff. The Fels Longitudinal Study began in 1929 with a major goal of following physical growth and development in a cohort of 1,000 people from birth throughout their entire life cycle (32). Data at birth, including head circumference at birth, obtained since 1975, come from relatives of the early cohorts.

Data Exclusions

Several exclusions were made prior to curve smoothing. First, data for all very low birthweight (VLBW) infants (<1,500 grams) were excluded from the infant growth charts, primarily because the growth of VLBW infants is known to be markedly different from that of higher birthweight, full-term infants. For NHANES I and II, if a reported birthweight from the interview questionnaire was not available, an exclusion was not applied. As part of the NHANES III protocol, birth certificates were obtained from the States for children born in the United States. For NHANES III, if a reported birthweight was missing from the survey interview data, birthweight from the child's birth certificate was used to determine possible exclusion, and, if neither were available, an exclusion was not made. Second, data from NHANES III for children greater than or equal to 6 years of age were excluded from the charts for weight-for-age, weight-for-stature, and BMI-for-age. Inclusion of these data would have led to the underclassification of overweight, because overweight cutoff criteria based on weight- and BMI-for-age percentiles would have been shifted upward. Third, 11 infants whose recumbent length and stature differed by greater than or equal to 5 cm were excluded from the length-for-age, weight-for-length, stature-for-age, weight-for-stature, and BMI-for-age charts. Fourth, two outlier values, one for head circumference of an infant girl, and one for recumbent length of an infant boy, were excluded because the measurement values and the sampling weights were extreme.

Statistical Curve Smoothing Procedures

Data from the national surveys were pooled because no single survey in the NHANES series has enough observations to construct growth charts. Sample sizes from 400 to 500 are required to achieve precision of the empirical percentiles at the specific ages selected for the curve fitting (33). This is particularly important for outlying percentiles that are used in research and clinical practice. Pooling enhances the number of subjects at each age, thereby increasing the stability of the outlying percentile estimates.

Statistical sample weights were available for each national survey. These sample weights take into account the unequal probabilities of selection resulting from the complex sampling cluster design, planned oversampling of selected subgroups, nonresponse, and noncoverage. These survey-specific sample weights were applied to the national survey data resulting in each survey representing the U.S. population at the time the survey was conducted. All statistics were calculated with the original survey sample weights. Sampling weights were not available for the supplemental data.

Statistical procedures were applied to the observed data in two stages, first to generate initial smoothed curves for selected major percentiles and second to generate the parameters that were used to construct the final smoothed curves and additional percentiles. The first stage is referred to as the curve smoothing stage, and the second stage as the transformation stage. In the first stage, selected empirical percentiles were smoothed with a variety of parametric and nonparametric regression procedures. In the transformation stage, the smoothed curves were approximated using a modified LMS estimation procedure to provide the transformation parameters, lambda, mu, and sigma (LMS). This resulted in final percentile curves that closely matched the percentile curves smoothed in the first stage and allowed computation of additional percentiles and z-scores. The procedures for each stage are described

Table D. Summary of curve smoothing procedures

Curve	Curve smoothing procedures
Weight-for-age	For birth to 36 months, a 3-parameter linear model fit to empirical percentile points for weight at midpoints of age intervals, and anchored (i.e., forced) at birth and at 2.75 years. Averages of weighted empirical percentiles at 2.25 and 2.75 years (based on data used for birth to 36 months and 2 to 20 years) substituted for data points in the 24 to 36 months range. For 2 to 20 years, locally weighted regression (LWR) based on 15-point smoothing for boys and 17-point smoothing for girls. Fit to empirical percentile points for weight at midpoints of age intervals, combined averages of weighted empirical percentiles at 2.25 and 2.75 years (based on data used for birth to 36 months and 2 to 20 years), and predicted values for 2 to 3 years at 0.1 year intervals from the 3-parameter linear model used for birth to 36 months. All results from the 3-parameter linear model and LWR were combined and refit at midpoints of age intervals from birth to 20 years using a 10-parameter polynomial regression model for boys and 9-parameter polynomial regression model for girls.
Length-for-age and Stature-for-age	For length-for-age, birth to 36 months, a 3-parameter linear model was fit to empirical percentile points for length at midpoints of age intervals and to birth data. For stature-for-age, 2 to 20 years, a 10-parameter nonlinear model was fit to empirical points for stature at midpoints of age intervals. Results from the 3-parameter linear model used for length-for-age were adjusted by subtracting 0.8 cm from length to make length continuous with stature in the overlapping age interval of 24 to 36 months. Percentiles in the overlap period were averaged by assigning weights of 1, 11/12, ..., 1/12, 0 at 24, 25, ..., 35, 36 months, respectively, to the adjusted length-for-age. Opposite weights of 0, 1/12, ..., 11/12, 12/12 at 24, 25, ..., 35, 36 months, respectively, were assigned to smoothed stature-for-age percentiles. The final length-for-age and stature-for-age curves were created by adding back 0.8 cm to the smoothed length.
Head circumference-for-age	For birth to 36 months, a 3-parameter linear model was fit to empirical percentile points for head circumference at midpoints of age intervals and to birth data.
Weight-for-length and Weight-for-stature	Empirical weight-for-length data were adjusted by subtracting 0.8 cm from length to make length continuous with stature in the overlapping age interval of 24 to 36 months. The combined adjusted weight-for-length and weight-for-stature data were smoothed with a 5-parameter polynomial regression model, fit to empirical percentile points for weight at midpoints of 2 cm intervals. After applying LMS, separate weight-for-length curves were created by adding 0.8 cm back to length.
BMI-for-age	For 2 to 20 years, LWR model was based on a 5-point smoothing at midpoints of age intervals for ages 2 to 12.5 years, and a 25-point smoothing for boys and a 27-point smoothing for girls for ages 13 to 20 years. The curves were further smoothed with a 4-parameter polynomial regression model fit to smoothed percentile points for BMI at midpoints of age intervals.

in detail for each chart and are summarized in table D.

Age and Length Groupings

Before smoothing, data were grouped by single month of age for the development of charts relating size to age. Each month of age was truncated to the nearest completed month, for example, 1 month (1.0–1.9 months), 11 months (11.0–11.9 months), 23 months (23.0–23.9 months), and so forth. From birth to 12 months, the empirical percentile estimates were made at 1-month intervals; from 12 to 24 months, the empirical percentile estimates were made at 3-month intervals; and at 24 months and beyond, empirical percentile estimates were made at 6-month intervals. All ages were labeled as the midpoint of the defined age groups. For the infant charts, infants were grouped as follows: 0.5 months = 0.1–0.9 months (birth was not included), 1.5 months = 1.0–1.9 months, ..., 11.5 months = 11.0–11.9 months; 13.5 months = 12.0–14.9 months, 16.5 months = 15.0–17.9 months, 19.5 months = 18.0–20.9 months, 22.5 months = 21.0–23.9 months; 27.0 months = 24.0–29.9 months, and 33.0 months = 30.0–35.9 months. For the charts for older children and adolescents, subjects were separated into 36 half-year age groups. Each age group was categorized by the midpoint of an age range. For example, age 2.25 years included ages from 2.0 years to 2.5 years of age. This pattern continued up to the 19.75 year age interval in which the age range is from 19.5 to 20.0 years of age.

Before smoothing, the length and stature data were grouped by 2-cm intervals. For example, 46 cm = 45–46.9 cm.

Curve Smoothing Stage

For each growth chart, the initial smoothing methods were applied to nine empirical percentiles (3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 97th). In addition, the 85th percentile was included in the BMI-for-age charts because the 85th percentile of BMI has been recommended as a cutoff to identify children and adolescents at risk for overweight (34,35).

The weighted empirical percentile estimates were obtained by applying the survey-specific sample weights to calculate weighted empirical percentile points at the midpoint of each age group (or the midpoint of each 2-cm interval for length or stature). The irregular plots of empirical percentile values had to be smoothed to produce clinically useful percentile curves.

Several different approaches were used in the smoothing stage. The empirical percentiles for infant weight, length, and head circumference were smoothed using a family of three-parameter linear models that have been used previously to describe age-related changes in growth from birth to age 36 months (36–38). Stature-for-age was smoothed using a nonlinear model whereas weight-for-stature and weight-for-length were smoothed using a 5-degree polynomial regression model. Two-step smoothing was applied to weight-for-age in infants and older children and BMI-for-age. In the first step of smoothing weight-for-age and BMI-for-age for older children, locally weighted regression (LWR) was used. Polynomial regression was used in the second step of smoothing weight-for-age and BMI-for-age. The smoothing stage resulted in every chart having a

parametric form with estimated parameters specific for each selected major percentile.

The parameters of the linear regressions were estimated using the SAS procedure REG, and the parameters in the nonlinear regression were estimated using the SAS procedure NLIN (39). The fit of the models was evaluated using root mean square error (RMSE), R^2, and CV (40).

The Transformation Stage

In order to estimate any percentile and allow calculation of standard deviation units and z-scores, a modified LMS statistical procedure was applied to the smoothed percentile curves. The LMS method does not change the distribution of percentile curves in a growth chart; rather it provides a way to estimate percentiles in a continuous manner.

The distribution of some anthropometric data used in the growth charts are skewed. To remove skewness, a power transformation can be used to stretch one tail of the distribution while the other tail is shrunk. A Box-Cox transformation can make the distribution nearly normal (41). The assumption is that, after the appropriate power transformation, the data are closely approximated by a normal distribution (42). The transformation does not adjust for kurtosis, which is a less important contributor to nonnormality than skewness (43).

In the LMS technique, three parameters are estimated: the median (M), the generalized coefficient of variation (S), and the power in the Box-Cox transformation (L). The L reflects the degree of skewness. The LMS transformation equation is:

$$X = M\,(1 + LSZ)^{1/L} \quad L \neq 0$$

or

$$X = M \exp(SZ) \qquad L = 0$$

where X is the physical measurement and Z is the z-score that corresponds to the percentile.

The key task of the transformation was to estimate parameters L, M, and S. With estimates of L, M, and S, values of X are connected to the values of Z through the above equation. The percentile is obtained from a normal distribution table where the z-score corresponds to the percentile of interest. For example, a z-score of 0.2019 corresponds to the 58th percentile. In the case of growth charts, with the L, M, and S parameters, it is possible to evaluate any single measure in a population as an exact z-score or percentile.

To generate age-specific estimates of L, M, and S, Cole (42,44) has recommended applying a penalized likelihood estimation procedure to the raw data. In this approach smoothed curves of L, M, and S are generated first, and then smoothed percentile curves, or an individual standardized score, can be obtained from the values of L, M, and S.

In contrast to the original LMS procedure, a modified LMS estimation procedure was created and used to generate the 2000 CDC Growth Charts. In the modified LMS approach, empirical percentile curves were initially smoothed and parametric models were generated, as described above. Then, at each age or length/stature interval, a group of 9 equations (10 for BMI charts) was generated by specifying the LMS transformation equations for the previously smoothed major percentiles. A simultaneous solution for the three parameters of L, M, and S from the group of specified equations was generated using the SAS procedure NLIN (39). By minimizing the sum of squared errors, the set of L, M, and S parameters was obtained as the best solution to a system of equations rather than as likelihood-based estimates from empirical data. This approach is similar to the method used by Cole to estimate LMS parameters from published percentile curves (45–47).

This modified LMS procedure produced final curves that are extremely close to the smoothed percentile curves obtained from the first stage of smoothing. The net result is that the close fit of the smoothed curves from the first stage of smoothing to the empirical data is retained. In addition, the modified LMS method allows z-scores to be obtained in a continuous manner. The LMS values were calculated by solving equations that used the values for percentiles ranging from the 3rd to the 97th. Percentiles less than the 3rd or greater than the 97th are beyond the range of the data from which the LMS parameters were calculated. As in any statistical procedure, extrapolation beyond the range of the data should be done with caution.

The final set of percentile curves for the CDC growth charts presented in this report was produced using this modified LMS estimation procedure. In the transformation stage, percentiles were developed at 1-month or 1-centimeter intervals in the infant and child charts. Estimates of L, M, and S parameters in these intervals were calculated to provide the necessary tools for determining additional percentiles. Generally, 1-month or 1-centimeter intervals will be adequate for estimation or evaluation. To obtain percentiles at finer intervals, the L, M, and S values could be interpolated.

Detailed Procedures by Chart

Weight-for-Age

Combining infant and child/adolescent weight-for-age—After the infant weight-for-age and child/adolescent weight-for-age curves were smoothed using a 3-parameter linear model and LWR, the results were combined and refit from birth to age 20 years using a single regression model for each sex. The smoothed weight-for-age curves for infants and for older children were combined to obtain a seamless transition between the curves. Ultimately the combined weight-for-age curve was separated into infant and child/adolescent curves to facilitate use in clinical settings.

In order to combine the infant and child/adolescent weight-for-age curves, weighted averages of overlapping empirical percentiles from infant and child charts at 2.25 years (24.0–29.9 months) and 2.75 years (30.0–35.9 months) were calculated using the combined infant and child/adolescent data. The empirical percentiles were not identical at ages 24–36.9 months because VLBW infants (<1,500 grams) were excluded from the infant

percentiles, but included in the older child percentiles where the effect of VLBW is diminished. The averaged percentiles were substituted for the empirical values in smoothing the weight-for-age for infants and weight-for-age for children/adolescents. These combined percentile curves were fit by a 10-degree polynomial for boys and by a 9-degree polynomial for girls. A set of nine polynomial regression equations, one for each of the major smoothed percentiles, was solved simultaneously for infants and for children to estimate the *L*, *M*, and *S* parameters for boys and for girls separately.

Weight-for-age, birth to 36 months—The infant weight-for-age curves for ages birth to 36 months were smoothed initially with a 3-parameter linear model:

$$f(t) = a+b * \ln(t+0.5) + c(t+0.5)^{0.75}$$

where $f(t)$ is body weight in kg, t is age in months (calculated as midpoint of the age range), and a, b, and c are parameters to be estimated. The estimated values of $f(t)$ are the smoothed values. At birth, $t = 0$. Estimates of a, b, and c are specific for each of nine percentiles being smoothed. An exponent of 0.75 was selected based on the evaluation of RMSE after several models were tried, beginning with the exponent of 0.3.

After excluding birthweights <1,500 gm, the model was fit to the national data with anchor points at birth and at 2.75 years. In other words, when the regression line was fit, no error term was allowed at the two anchor points. The curves were anchored to the national distribution of birthweights (years 1968–80 and 1985–94) from NCHS natality files (that is, forced through the sex-specific summary values provided for the major centile lines at birth) after excluding birthweights <1,500 gm, and forced through the weighted average percentile values at 2.75 years.

Weight-for-age, 2 to 20 years—Initial smoothing of weight-for-age for older children involved combining the weighted average of the empirical percentiles for infants and older children at 2.25 and 2.75 years, predicted infant values for weight from 2 to 3 years at 0.1-year intervals from the 3-parameter linear model and the empirical percentiles from 3 to 20 years. This approach used all available information for infants after excluding data for VLBW infants and for older children where data for VLBW infants were not excluded. Some empirical data less than 2 years of age and greater than or equal to 20 years were included, as described below. This compound data set was smoothed with a locally weighted regression (LWR) procedure.

The LWR does not give any parameter estimates, but provides an intermediate smoothed curve for further parametric smoothing. Locally weighted regression applies a weight function to data in the neighborhood of the value to be estimated (48). Ages at measurements that are near that of the value to be estimated received larger weights than those farther away from the specific age. A weight function

$$Weight = \left(1 - \left|\frac{X_0 - X_i}{\Delta X}\right|^3\right)^3$$

applies larger weights to data points near the value to be estimated than to those further away, where X_0 is the central age at which the value is smoothed, X_i is the ith age from the central age and the value to which the weight is being assigned, and ΔX is the age range covered by the width of the moving regression window. The mechanics of LWR require the selection of a series of points on either side of the value to be estimated. This series of points constitutes the regression window. Windows for each of the values to be estimated overlap and are referred to as moving regression windows. The weighted least squares regression is applied to the values in each moving regression window to provide the smoothed estimate at X_0. The resulting estimates from each regression window form a smoothed curve.

The width of the LWR moving window for weight-for-age was chosen after several trials to balance the degree of smoothness and fidelity to the data. For boys, each smoothed value was estimated by a weighted linear regression on the 15 neighborhood points adjacent to the estimated value. For girls, a 17-point smoothing procedure was chosen. Seven data points for boys and eight data points for girls at ages less than 2 years were necessary for smoothing the value at age 2 years. The weight value at age 1.75 years in boys was repeated 7 times from age 1.75 down to 1.15 years by 0.1-year intervals, and in girls was repeated 8 times from age 1.75 down to 1.05 years by 0.1-year intervals. Similarly, when smoothing the value at age 20 years, seven and eight data points at ages over 20 years were necessary for boys and girls, respectively. For boys, the empirical percentiles from 20.25 to 23.25 years by 0.5-year intervals were used as seven additional data points for smoothing. For girls, the empirical percentiles after age 18 years were very irregular due to the limited number of subjects and considerable variation in body weight. Therefore, instead of using empirical percentiles from 20 to 25 years, the value at age 20.25 years was repeated 8 times from age 20.25 to 23.75 years by 0.5-year intervals to achieve reasonably smoothed values near age 20 years.

Length-for-Age and Stature-for-Age

Combining length-for-age and stature-for-age—A smooth transition from the length-for-age to stature-for-age chart was required. Analyses of data from NHANES II and III children indicated that recumbent length is, on average, 0.8 cm longer than standing height (stature). Thus, it is desirable to have parallel smoothed percentile curves for length-for-age and stature-for-age with a difference of 0.8 cm between length and stature in the overlapping ages from 24 to 36 months.

To obtain these parallel curves, percentiles for each month of age were predicted by the 3-parameter model in the length-for-age portion and by the 10-parameter nonlinear model in the stature-for-age portion. Length-for-age percentiles were adjusted by subtracting 0.8 cm from length to make length commensurate with stature. Averages of the percentiles in the two charts in the overlapping ages were calculated by assigning weights of 1, 11/12, 10/12, ...,

1/12, 0 to values of length-for-age at 24, 25, 26, ..., 35, 36 months, respectively, and assigning opposite weights of 0, 1/12, ..., 11/12, 1 to values of stature-for-age at 24, 25, ..., 35, 36 months, respectively. These weighted average percentile values in the overlapping section were shared by both charts. Length-for-age was readjusted by adding back 0.8 cm to length, producing separate length-for-age and stature-for-age curves. This resulted in the two sets of parallel percentiles with a consistent separation of 0.8 cm in the overlapping section.

Two sets of nine equations (one set for length-for-age and one set for stature-for-age), for each of the major smoothed percentiles, were solved simultaneously to estimate the *L*, *M*, and *S* parameters for boys and girls separately. The nine final percentile curves for infants and children were predicted using the estimated *L*, *M*, and *S* values.

Length-for-age, birth to 36 months—The infant recumbent length-for-age curves for ages birth to 36 months were smoothed with a 3-parameter linear model:

$$f(t) = a+b * \ln(t+1) + c(t+1)^{0.5}$$

where $f(t)$ is length in cm, t is age in months (calculated as midpoint of the age range), and a, b, and c are parameters to be estimated. The estimated values of $f(t)$ are the smoothed values. At birth, $t = 0$. Estimates of a, b, and c are specific for each of nine percentiles being smoothed.

After excluding birthweights <1,500 gm, the 3-parameter model was fit to the national data and birth length distributions from Wisconsin and Missouri. In contrast to data from the NCHS surveys that were pooled prior to curve smoothing, the Wisconsin and Missouri data were not pooled, but were treated as two separate sets of data points in the curve smoothing. Because the fitted values did not match other data sets well in the first few months of life, and because the smoothed point at 2.5 months was unstable due to insufficient sample size, data from a subset of the PedNSS at ages 0.5, 1.5, and 2.5 months were also included. Inclusion of these additional data at younger ages provided a better fit of the 3-parameter model in the first several months of age. To gradually merge the PedNSS data with the national survey data, PedNSS data were averaged with the national data at ages 3.5 and 4.5 months, after which the national data were used exclusively.

Stature-for-age—The stature-for-age curves for ages from 2 to 20 years were smoothed with a nonlinear model that ensured a monotonic increase in stature:

$$f(t) = aq/(1+e^{-b1(t-c1)}) + ap/(1+e^{-b2(t-c2)}) + (f-a) / (1+e^{-b3(t-c3)})$$

where $f(t)$ is stature in cm, t is age in years (calculated as midpoint of the age range), and a, b_1, b_2, b_3, c_1, c_2, c_3, p, q, and f are parameters to be estimated ($p = 1-q$). The estimated values of $f(t)$ are the smoothed values. Estimates of a, b_1, b_2, b_3, c_1, c_2, c_3, p, q, and f are specific for each of nine percentiles being smoothed.

The empirical percentile curves derived from the national survey data were irregular partly due to sampling variations and the small number of subjects older than 18 years. To aid in smoothing the irregular empirical percentile curves at older ages, the empirical data were extended to age 25 years in 0.5-year intervals. For girls, empirical data for the 6-month age group from 1.5 to 2.0 years (midpoint 1.75) were also included to provide smoothed estimates closer to the empirical percentiles than the estimates obtained without inclusion of such data. Unadjusted recumbent length data were used as a proxy for stature in the age group from 1.5 to 2.0 years.

Head Circumference-for-Age

The infant head circumference-for-age curves for ages birth to 36 months were smoothed with a 3-parameter linear model:

$$f(t) = a+b * \ln(t+2) + c(t+2)^{0.5}$$

where $f(t)$ is head circumference in cm, t is age in months (calculated as midpoint of the age range), and a, b, and c are parameters to be estimated. The estimated values of $f(t)$ are the smoothed values. At birth, $t = 0$. Estimates of a, b, and c are specific for each of nine percentiles being smoothed. After excluding birthweight <1,500 gm, the model was fit to the national data and head circumference at birth from the Fels Longitudinal Study.

A set of nine 3-parameter linear equations, one for each of the major smoothed percentiles, was solved simultaneously to estimate the *L*, *M*, and *S* parameters for boys and girls separately. The nine final percentile curves for infants were predicted using the estimated *L*, *M*, and *S* values.

Weight-for-Length and Weight-for-Stature

Similar to length-for-age and stature-for-age, weight-for-length and weight-for-stature required a smooth transition. Consequently weight-for-length and weight-for-stature were developed together using a single regression model. Before fitting the model to the data, 0.8 cm was subtracted from each empirical recumbent length data point. The shifted empirical weight-for-length data were smoothed simultaneously with the empirical weight-for-stature data using a 5-degree polynomial regression model.

The 5-degree polynomial regression model was fit to the national data and to weight-for-length data at birth from Wisconsin and Missouri. The birth length intervals from Wisconsin and Missouri began at 45 cm. However, there was a discontinuity between the State data and the national data perhaps due to lack of data between birth and 2 months. To avoid lowering the estimates for weight-for-length, data from 53 to 65 cm from the State or national data were omitted in the smoothing procedure.

The weight-for-length and weight-for-stature charts are age independent. Empirical percentiles of weight were based on recumbent length or stature in 2-cm intervals. Although the weight-for-length chart was developed for use with infants from birth to 36 months, and weight-for-stature was developed primarily for use with children from 24 to 60 months of age to maximize sample sizes, an upper age limit was not used in the development of either chart. Available weight-for-length data ranged from 45

to 109 cm and available weight-for-stature data ranged from 77 to 127 cm for calculating empirical percentiles. After the final curve smoothing, weight-for-length was truncated to 103 cm and weight-for-stature was truncated to 121 cm on the final charts.

A set of nine 5-degree polynomial regression equations, one for each of the major smoothed percentiles for the combined weight-for-length and weight-for-stature data, was solved simultaneously to estimate the *L*, *M*, and *S* parameters for boys and girls separately. The nine final percentile curves for infants were predicted using the estimated *L*, *M*, and *S* values. To obtain separate weight-for-length and weight-for-stature curves, 0.8 cm was added back to all the smoothed length values. This was accomplished by shifting back the corresponding length values for the length-specific weight, *L*, *M*, and *S*, by 0.8 cm to form the weight-for-length measure from the weight-for-stature scale. The 85th percentile of weight-for-stature was calculated subsequently from the *L*, *M*, and *S* values.

Body Mass Index-for-Age

Empirical percentiles from the national data were smoothed with LWR. Ten empirical percentiles were calculated for the BMI-for-age charts because the additional 85th percentile was required for boys and girls to identify children and adolescents at risk for overweight. Each smoothed value was estimated by weighted linear regression on the five-neighborhood points adjacent to the value to be estimated from ages 2 to 12.5 years. From 13 to 20 years, a 25-point smoothing procedure was used for boys and a 27-point smoothing procedure was used for girls. At the lower end (that is, age 2 years), two additional points were needed in the smoothing window, so a neighborhood point of 1.75 years was used for BMI. This was calculated using unadjusted recumbent length, repeated at 1.75 and at 1.71 years for both sexes. At the upper end (that is, age 20 years), the maximum BMI values in each empirical percentile from age 19.75 through 25.25 years were chosen and repeated in 0.5-year intervals from 20.25 through 25.75 years for boys or from 20.25 through 26.25 years for girls. Taking maximum values as additional data in smoothing the windows ensured that the BMI curves did not increase beyond the maxima at the upper ends of the age ranges. The smoothed percentile curves obtained through LWR were then fit by a 4-degree polynomial regression to achieve parametric percentiles. (See section on weight-for-age, 2 to 20 years, above, for further description of LWR.)

A set of 10, 4-degree polynomial regression equations, 1 for each of the major smoothed percentiles, was solved simultaneously to estimate the *L*, *M*, and *S* parameters for boys and girls separately. The 10 final percentile curves for infants were predicted using the estimated *L*, *M*, and *S* values.

Results

Observed and Smoothed Percentiles

The observed percentile distributions, along with means and standard deviations, are shown by sex and age in detailed tables 9–16. Selected smoothed percentiles (3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 97th for all charts, and 85th for BMI-for-age and weight-for-stature) are shown in detailed tables 17–24 for the 16 age- and sex-specific growth charts. Also presented in these tables are the *L*, *M*, and *S* parameters that were used to create the final charts and are needed to generate additional percentiles and z-scores.

The smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, and 97th percentile curves that constitute the 16 individual CDC growth charts for the United States are shown in figures 1–16. In addition, the 85th percentile is shown in figures 13 and 14 for BMI-for-age and in figures 15 and 16 for weight-for-stature. Two additional sets of individual charts not shown in this report are available on the Internet (www.cdc.gov/growthcharts). One set shows curves ranging from the 5th to 95th percentiles (without the 3rd and 97th), and another set has the 3rd to 97th percentiles (without the 5th and 95th).

The growth charts shown in figures 1–14 have a primary scale in English units (lb, in), and a secondary scale in metric units (kg, cm), except in the BMI-for-age charts where there are single scales (kg/m^2) as shown in figures 15 and 16.

Figures 17–26 show the charts developed for clinical use depicting the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles, and 85th for BMI-for-age and weight-for-stature. This format has two charts per page and includes tables for recording measurement data. For the clinical charts, the primary scale is metric and the secondary scale is English. A comparable set of clinical charts with the 3rd and 97th percentiles in place of the 5th and 95th not shown in this report is available on the Internet (www.cdc.gov/growthcharts).

Evaluation of the Revised Growth Curves

After the initial smoothing and transformation stages were completed, the percentile curves were evaluated. Transitions between the infant and older child charts were reviewed and each major percentile curve (3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th, and 85th for BMI-for-age) was compared graphically with the corresponding empirical data. In addition, the percent of empirical data below the smoothed percentiles was calculated and compared with the expected values. The objective of these procedures was to search for any large or systematic differences between the smoothed percentiles and the empirical data.

Evaluation of the transitions between the charts from birth to 36 months to the charts from 2 to 20 years indicated that disjunctions that were present in the 1977 NCHS charts were not present in the 2000 CDC charts. The final charts for length-for-age and stature-for-age were constructed simultaneously with an imposed parallel separation of 0.8 cm, based on the average difference between measured length and stature. Consequently, the smoothed percentile curves for length-for-age and stature-for-age are

parallel to each other as shown in figures 27–28. A child should have similar values for length-for-age or stature-for-age. Weight-for-length and weight-for-stature were constructed with an imposed offset of 0.8 cm (figures 29 and 30).

The results of graphical comparisons for evaluation of the final curves are shown in figures 31–62. Overall, the smoothed curves fit the empirical data well, without any systematic departures. This was particularly true for stature-for-age (figures 55–58). Nevertheless, for all the curves, the empirical data points at the outer percentiles tended to be more irregular relative to those at the more central percentiles.

Although the performance of the final smoothed curves was judged acceptable, the weight-for-age curves diverged from the empirical data points at some ages, even at the median, where estimates generally are expected to be most stable. This divergence was particularly evident from 3 to 11 months (figures 31–34) and after approximately 12 or 13 years (144–156 months in figures 53–54). For BMI-for-age (figures 59–62), the empirical data, especially for values greater than or equal to the 75th percentile and during the adolescent years, showed a high degree of variability around the smoothed percentile lines.

The observed and the expected percents below the smoothed percentiles are shown graphically in figures 63–94. Approximately 50 percent of the observed data would be expected to fall below the smoothed median or 50th percentile. The findings indicated acceptable results for the percent of empirical data below the smoothed curves.

Differences Between the 1977 NCHS and the 2000 CDC Growth Curves

The smoothed 1977 and 2000 percentile curves were compared graphically as shown in figures 95–108. The comparisons are limited to the charts, ages, and percentile lines common to both sets of references. Thus, comparisons were not possible for the new BMI-for-age charts, for the weight-for-stature charts above 120 cm of stature, for ages over 17 years on any chart, or for the 3rd and 97th percentiles on any chart.

Overall, the 1977 and the 2000 growth curves are quite similar. The differences that exist are more apparent in charts for infants where national survey data were previously lacking than in the charts for older children. For infants, the major differences were seen in the head circumference-for-age charts. In the other infant charts, differences generally occurred at the outer (lower and upper) percentiles. For older children, there were almost no differences in the stature-for-age charts and only minor differences in the weight-for-age charts.

Infant Charts

From approximately 12 to 24 months for infant weight-for-age, the 2000 percentiles are generally higher than the corresponding 1977 percentiles. This is most evident at the 5th and 10th percentiles (figures 95–96). The 2000 length-for-age curves are generally lower than the 1977 curves, especially after 6 months of age when the 2000 10th percentile approximates the 1977 5th percentile (figures 97 and 98). In the weight-for-length curves (figures 99 and 100), for lengths ranging from approximately 50 to 70 cm, the 2000 curves are higher than the 1977 curves. This is most evident at lower percentiles, where the 5th percentile for the 2000 charts is equivalent to the 25th percentile in the 1977 charts. The dip that occurred in the 1977, 5th and 10th percentiles at the 50–70 cm range is absent from the 2000 weight-for-length charts. Comparisons of the head circumference-for-age percentiles indicate considerable differences (figures 101 and 102). Generally, the 2000 smoothed percentiles are higher than the 1977 percentiles from birth until approximately 4–6 months, where a crossover occurs and the 2000 curves become lower than the 1977 curves (figures 101 and 102).

When the 2000 charts are used there will be some differences in clinical classifications relative to the 1977 charts. For example, with the 2000 charts, infants will be more often classified as underweight, less often classified as high weight-for-age, less often classified as having short length-for-age, less often classified as having small head circumference particularly after 6 months, and more often classified as having large head circumference.

Child/Adolescent Charts

Comparisons of the weight-for-stature charts are limited because the range of statures differed in the 2000 charts compared with the 1977 charts. For matching statures within the range shown, weights in the 2000 charts tend to be higher than weights in the 1977 charts, especially at larger statures and for girls (figures 103 and 104). Overall, from approximately 2 to 14 years, the 1977 and 2000 weight-for-age curves are similar. Even though the 1977 and 2000 data sets for weight-for-age closely match after 6 years, differences in the percentile curves beyond age 14 years (168 months) may reflect limitations of the curve smoothing procedures in the 1977 weight-for-age charts (figures 105 and 106). The 1977 and 2000 charts for stature-for-age are quite similar (figures 107 and 108).

Discussion

Revision Process

The 1977 NCHS Growth Charts have been widely used in pediatric practice and public health for more than 20 years. Although some concerns about these growth charts arose, the charts had not undergone a major formal revision since they were developed. There was, however, an interim adjustment to the length-for-age and stature-for-age, and weight-for-length and weight-for-stature curves, designed for use in limited applications for the analysis of population-based survey and surveillance data (22,49). In 1985, when planning the sample design for NHANES III, NCHS began the growth

chart revision process with the decision to oversample infants and young children for the purpose of revising the 1977 growth charts.

Growth Chart Workshops

Beginning in December 1992 NCHS sponsored a series of workshops to obtain expert input for revising the 1977 NCHS Growth Charts. These workshops were intended to provide options and recommendations that would be considered in making final decisions on how best to proceed. The participants and highlights of the workshops are presented in appendix I. Three of these workshops were summarized in reports that are available on the Internet (www.cdc.gov/growthcharts). The workshop reports include appendixes with supporting data and references.

Major Features of the 2000 CDC Growth Charts for the United States

The 2000 CDC Growth Charts for the United States differ from the 1977 NCHS Growth Charts with regard to data and methods used in their construction. In addition, there are a number of new features in the 2000 charts that were not previously available:

- **National survey data**
  In the 2000 CDC charts, nationally representative survey data, supplemented with a limited amount of data from other sources, replaced the Fels data used in the 1977 NCHS infant growth charts from birth to 36 months.
- **Body mass index-for-age charts**
  New sex-specific BMI-for-age charts for 2 to 20 years were developed to replace the 1977 NCHS weight-for-stature charts that were applicable only at prepubescent ages for statures for boys ranging from 90 to 145 cm and for girls ranging from 90 to 137 cm. Revised weight-for-stature charts are available for optional use from ages 2 to 5 years. Either BMI-for-age or weight-for-stature charts may be used to assess risk of overweight from ages 2 to 5 years.
- **Extended age range**
  The revised charts were extended by 2 years beyond the 1977 NCHS charts to include children and adolescents from 2 to 20 years of age. This change was made to accommodate adolescents who continue to be seen by pediatricians through their later teenage years.
- **Additional percentiles**
  The 3rd and 97th percentiles were added to each chart to facilitate plotting data for children at extremes of the distribution. The major percentiles included in the 1977 NCHS charts (5th, 10th, 25th, 50th, 75th, 90th, and 95th) were retained in the revised charts. The 85th percentile was added to weight-for-stature and BMI-for-age charts, enhancing their use as screening tools to identify children and adolescents who may be overweight or at risk of overweight.
- **Corresponding percentiles and z-scores**
  The 2000 CDC Growth Charts can be used to obtain percentiles and z-scores. To meet the needs of researchers, for analyses of surveillance data, and to monitor changes in growth indicators for individuals, z-scores can be obtained and exact percentiles can be calculated.
- **Smooth junction between length and stature**
  The revised charts largely correct discontinuities that existed in the 1977 charts for infants and older children from 24 to 36 months. These disjunctions were the result of using data from different sources.

Using the Revised Growth Charts

Screening for Health and Nutritional Status

The 5th and 95th percentiles of the 1977 NCHS Growth Charts have been used for many years as screening indicators, particularly for infants. These percentile cutoff values are used to help identify infants and children who are at increased nutritional and overall health risk.

Where there are differences between the 2000 and the 1977 curves, the percentile ranking of a child may differ. In general, when the upper percentiles of the revised curves are higher than the corresponding percentiles of the 1977 curves, this will result in *less* frequent classification as high risk. When the lower percentiles of the revised curves are higher than the corresponding percentiles of the 1977 curves, classification as high risk will be *more* frequent. For example, the 90th and 95th infant weight-for-age percentiles of the revised curves are higher than the corresponding percentiles of the 1977 curves from approximately 6 to 36 months for boys, and from 12 to 36 months for girls. This shift would be expected to result in lower estimates for the prevalence of overweight when using the revised charts. In contrast, after approximately 6 months, all percentiles in the revised head circumference charts are lower than the corresponding percentiles in the 1977 charts. The expected impact for clinical screening or for population-based prevalence estimates, using the 2000 charts compared with the 1977 charts, is that children may be classified less frequently as having small head circumferences and may be more frequently classified as having large head circumferences. Other examples are evident in the detailed figures in this report that compare the 2000 percentile curves with the 1977 percentile curves.

Racial-Ethnic Considerations

Children of all major racial-ethnic groups appear to have similar growth potential. Studies have demonstrated that genetic effects on growth are small compared with the effects of the environment, nutrition, and health. Regardless of racial-ethnic status, children provided with good nutrition, access to health care, and good social and general living conditions have similar growth patterns (13,50–55).

The 2000 growth charts were produced for all children in the U.S. population. From a practical standpoint, the NCHS health examination surveys are not designed to provide separate reliable growth estimates for each of the racial-ethnic groups in the United States. Even after pooling data sets from the various national surveys, the sample sizes for the individual major racial-ethnic groups in the NCHS surveys did not meet statistical requirements for precise estimates of outlying percentiles (33).

Given the evidence that differences in growth are primarily due to environmental and socioeconomic constraints, in combination with insufficient data for each racial-ethnic group, the development of separate racial-ethnic growth charts for various groups that constitute the U.S. population was neither justified nor practical. Even if sufficient data were available, it would be difficult to develop and to apply ethnic-specific growth charts because many children are ethnically diverse.

Assessing the Growth of Breast-Fed Infants

The 1977 NCHS Growth Charts for infants were based entirely on data from the Fels Research Institute collected 1929–75. In this study population, as in the general population during this period, infants were mainly formula-fed, although a small percent were exclusively breast-fed for 3 months. In addition, it is possible that infants in the Fels Longitudinal Study were supplemented early with solid foods, which could have an impact on growth that would be reflected in growth charts constructed from these data (56).

The 2000 CDC Growth Charts include data for formula-fed and breast-fed infants, proportional to the distribution of breast- and formula-fed infants in the population. During the past two decades, approximately one-half of all infants in the United States received some breast milk and approximately one-third were breast-fed for 3 months or more (57). By replacing data from the Fels Research Institute with national survey data collected from 1970 to 1994, the combined growth patterns of breast-fed and formula-fed infants in the U.S. population are represented.

Breast-feeding is recommended as the feeding method of choice for most full-term infants during the first 6 months after birth and should be continued with the addition of solid foods through the first 12 months (58). The association between breast-feeding and size and growth in infants has been the topic of many investigations. In general, breast-fed infants tend to gain weight more rapidly in the first 2–3 months. From 6 to 12 months breast-fed infants tend to weigh less than formula-fed infants (18,59). These observations have led to recommendations for the development of new infant growth references based on healthy breast-fed infants (18,19,60,61). A study sponsored by the WHO is currently collecting data at study centers in six countries. These data will be used to develop a new international growth reference.

Body Mass Index-for-Age Growth Charts

Body mass index (BMI; kg/m^2) has been recommended for use in children, adolescents, and adults to assess weight, adjusted for stature (34,35,62). BMI tracks over time and the tracking tends to increase at older adolescent ages (64,65). By age 8 years, however, most children are in the percentile range they will follow until the end of growth (65,66).

The pattern of the BMI curves indicates that BMI increases rapidly from birth to approximately 8 months of age, then decreases until approximately age 6 years, when it reaches its nadir before rebounding, or increasing once again (67). This has been termed the *adiposity rebound*, because it is believed to be the age when body fatness begins to increase after reaching a minimum. This pattern is evident in the revised growth charts. The younger the age at which a child's BMI curve is at its nadir, the greater the likelihood that the level of adiposity will be high in adolescence and early adulthood (66,68,69). Children at higher percentiles for BMI tend to achieve their adiposity rebound at younger ages. These children have a greater likelihood to track at a higher BMI percentile with increasing age.

BMI is commonly used in clinical evaluation of individuals and in population-based studies. BMI can be calculated by dividing weight in kilograms (kg) by stature in meters squared (m^2). As an alternative to doing the calculation, BMI can be estimated from a nomogram or a look-up table (www.cdc.gov/growthcharts). Available nomograms have the disadvantage of approximating BMI only to the nearest integer. Numeric tables with precalculated BMI values to the nearest 0.3 units are preferred to intersecting line nomograms because they provide greater precision. In clinical assessment, a transition from the weight-for-length to the BMI-for-age charts from 24 to 36 months of age becomes possible when children can stand unassisted and adequately follow directions to assume the correct posture for a stature measurement.

Specialized Charts

Low Birthweight and Very Low Birthweight Infants

The revised growth charts for the United States include data on low birthweight infants but do not include data on very low birthweight infants (VLBW; <1,500 gm). Alternate charts are available to assess the growth of VLBW infants. Perhaps the most recent are those developed from data collected in the National Institute of Child Health and Human Development Neonatal Research Network Centers (70). This recent reference was developed from data on 478 infants who were appropriate-for-gestational age and survived to discharge. Prospective growth curves are plotted by 200 gm birthweight intervals for birthweights ranging from 501 to 1,500 gm. However, these charts only extend to about 120 days uncorrected postnatal age or until a body weight of 2000 gm. These charts have a very limited range of use. Perhaps the best general reference available for VLBW infants is the Infant Health and Development

Program (IHDP) reference (71,72,73), although it has limitations. The IHDP growth charts may be considered to assess the growth of VLBW infants from an age corrected for gestation of 40 weeks to 36 months. However, the IHDP charts are based on data collected in 1985, which was before current medical and nutritional care practices were being used. VLBW infants may show more accelerated growth in weight-for-age during the first 6 months of age corrected for gestation than depicted in the IHDP reference and will be lighter for their length than the reference until they are 60 cm long, becoming increasingly heavier for their length than the reference after 60 cm. Alternatively, the new 2000 CDC Growth Charts can be used to assess VLBW infants, but their measurements may fall in the lower percentiles. Length-for-age will show catch up between 18 and 30 months and weight-for-age will fall in the lower percentiles but follow a similar pattern to the CDC growth charts.

Children With Special Health Conditions

A variety of health conditions such as Down syndrome, cerebral palsy, Turner syndrome, and others affect growth status. There are specialized charts that may be considered for use with children affected by these conditions (74–76). These specialized growth charts provide useful growth references, but may have some limitations. Generally, they are developed from relatively small samples. One option is to plot the growth patterns of these children on the specialized charts and the CDC growth charts. This will allow comparisons of growth to the general population of children and to the references for children identified with a given condition. In most cases, BMI charts are not available for special conditions, and the CDC charts would provide a useful reference to monitor weight in relation to stature.

General Growth Chart Principles

Growth References and Standards

The distinction between a growth reference and a growth standard is relevant to the development and application of growth charts. The WHO working groups (61,77) have defined a reference as a tool for providing a common basis for purposes of comparison, and a standard as embodying a concept of a norm or target, that is, a value judgment. In simple terms, a reference describes "what is," whereas a standard prescribes "what should be." In practice, however, reference values are often used as a standard (78). Growth references are intended to be used to screen and monitor growth in individuals and populations. They are not intended to be the sole independent diagnostic instruments upon which clinical decisions are made.

In the development of the 1977 NCHS Growth Charts, the task force adhered strictly to a policy of no data adjustments (8). In the development of the 2000 CDC Growth Charts, two notable data exclusions were made. The first exclusion was of data for all VLBW infants and the second was of body weight observations for NHANES III subjects ages 6 years or over. The exclusion of VLBW infants was based on the fact that alternative growth references are available and are appropriate to monitor the unique growth patterns of VLBW infants.

The exclusion of NHANES III body weight data for children and adolescents was made after consultation with numerous experts. Although this meant straying from a pure reference, the advantages of excluding these data were judged to outweigh the disadvantages. Had these data been retained, the increase in body weight among NHANES III subjects would have shifted the weight- and BMI-for-age percentile curves upward. This would have led to identifying fewer children and adolescents as overweight or at risk of overweight. The revised U.S. growth charts are still intended to be growth references.

In addition to data exclusions, there were some minor data adjustments and inclusions of data that were not nationally representative. The length data were adjusted to integrate them with stature data in the smoothing process. State data were used for length at birth and weight-for-length at birth, Fels data were used for head circumference at birth, and PedNSS data were used for length-for-age from 0.5 to 5.0 months. These approaches were taken to provide more complete and accurate charts, and do not diminish their use as growth references based on well-defined data sources.

Roles of Cross-Sectional and Longitudinal Data in Growth Charts

There is a difference between growth (or size) charts and growth velocity charts (8). The 2000 CDC Growth Charts for the United States are based primarily on cross-sectional national survey data that were statistically smoothed to create percentile curves. The curves were superimposed on grids that permit interpretation of an individual's attained body size (weight, length or stature, and head circumference) at given ages, or weight at given lengths or statures, in comparison with the body sizes of children in the reference population. Therefore, these charts more appropriately may be considered size charts. When serial values for an individual are plotted, assessments can be made of that individual's growth progress over time.

Growth velocity charts are constructed from incremental data obtained from longitudinal observations. Growth velocity charts are more sensitive indicators of small changes in growth status than the size-attained charts, and are more useful when evaluating changes in growth rates that are important in selected growth disorders and therapies. Incremental growth charts and growth tables for

6-month increments have been developed using weight, recumbent length, stature, and head circumference data from the Fels Longitudinal Study (79,80).

Percentiles and Z-Scores

Smoothed percentile curves and z-scores are used to evaluate the growth of children. Percentiles are the most commonly used clinical indicator to assess the size and growth patterns of individual children in the United States. Percentiles rank the position of an individual by indicating what percent of the reference population the individual would equal or exceed. For example, on the weight-for-age growth charts, a 5-year-old girl whose weight is at the 25th percentile, weighs the same or more than 25 percent of the reference population of 5-year-old girls, and weighs less than 75 percent of the 5-year-old girls in the reference population.

A z-score is the deviation of the value for an individual from the mean value of the reference population divided by the standard deviation for the reference population. Because z-scores have a direct relationship with percentiles, a conversion can occur in either direction using a standard normal distribution table. Therefore, z-scores and percentiles are interchangeable. Which one is used is based primarily on convention or preference. In certain population-based applications, such as research settings and surveillance systems, the mean and standard deviation are often calculated for a group of z-scores (61). In selected clinical situations where growth monitoring is an important evaluation tool and greater measurement precision is necessary, z-scores or exact percentiles may be preferred by clinicians.

To track growth below the 5th percentile, z-scores achieved widespread use. A z-score of –2 SD is accepted as a standard statistical cutoff point to determine the need for nutritional intervention and corresponds approximately to the 3rd percentile (z-score at 3rd percentile = 1.88) (77). Because the LMS values were calculated by solving equations that used the values for percentiles ranging from the 3rd to the 97th, the outermost percentiles less than the 3rd or greater than the 97th are beyond the range of the data. The sample sizes for the data used to calculate the growth charts were not adequate to calculate percentiles below 3 and above 97, corresponding to z-scores of –1.88 and 1.88. Extrapolation beyond this range of the data should be done with caution. In addition, a solution may not be obtained when both the Z and L are high and have opposite signs. Moreover, some z-score values may have extreme corresponding measurement values. For these reasons, any use of the LMS values to calculate z-scores below –2 (2.3 percentile) or above 2 (97.7 percentile) should be done with an awareness of the limitations. Z-scores and exact percentiles can be calculated using formulas and data tables available on the Internet (www.cdc.gov/growthcharts) or in the revised nutritional anthropometry module (NutStat) of CDC's Epi Info 2000. Epi Info is a public domain computer program available on the Internet (www.cdc.gov/epinfo).

Conclusions

The purpose of this revision to the 1977 NCHS Growth Charts was to provide better estimates of size and growth, using more comprehensive national survey data and improved statistical smoothing procedures. To construct clinically useful growth charts, it is necessary to have access to a reference population, to obtain anthropometric data, and to statistically smooth the observed data. In developing such reference data for children, it is not feasible to conduct a study that would obtain measures on the total U.S. population of children and adolescents. Instead, the reference population for the revised U.S. growth charts was primarily based on statistically representative samples of the U.S. pediatric population, measured in a series of cross-sectional surveys from 1963 to 1994, that were supplemented with limited data from other sources. Replacing the Fels data in the 1977 NCHS infant charts with national survey data addressed one of the major concerns with the 1977 charts.

National survey data, in combination with improved statistical smoothing procedures, produced curves with better transitions between the infant and older child curves from 24 to 36 months of age than were found in the 1977 curves. The statistical procedures used to generate the 2000 growth charts will allow users to calculate percentiles and z-scores that are completely interchangeable. This is an improvement over the 1977 NCHS charts where they often did not agree.

A major shortcoming in the 1977 NCHS charts was the inability to calculate a weight-for-stature value for post-pubertal adolescents. Overweight in children and adolescents is becoming more common in the United States (81–83), and screening tools are needed to identify individuals and population groups at risk. Expert committees have recommended use of the BMI to identify children who are overweight or at risk of becoming overweight (34,35). Development of the new BMI-for-age growth chart for boys and girls from 2 to 20 years of age provides a screening instrument to monitor weight adjusted for stature.

The 2000 CDC Growth Charts for the United States are intended to serve as a reference to evaluate physical size and growth for the majority of the pediatric population. For preterm, VLBW infants and children with specific conditions that may affect size and growth, various charts are available for alternative use, although most of these were developed from restricted samples that were not based on nationally representative survey data.

Differences between the 1977 and the 2000 growth charts have been illustrated in this report. In clinical practice most of these differences will not affect the way in which current evaluations are made. Substitution of the 2000 CDC charts for the 1977 NCHS charts in research, surveillance, food assistance, and other population-based activities may affect the classification of some individuals.

The revised growth charts should continue to meet the many uses that

growth charts currently serve in the United States. Users are encouraged to make the transition from the 1977 NCHS Grow Charts to the 2000 CDC Growth Charts. To facilitate this transition, master copies of the 2000 CDC Growth Charts are available on the Internet as high resolution graphics with guidelines for reproducing multiple copies (www.cdc.gov/growthcharts). CDC has made available camera-ready negatives to State health offices, and copies are also available through some infant formula manufacturers and professional organizations such as the American Academy of Pediatrics. Various proprietary software programs are available that incorporate the 2000 CDC Growth Charts in electronic formats, and CDC has included the normalized 1977 and the 2000 growth charts in the NutStat module of Epi Info 2000.

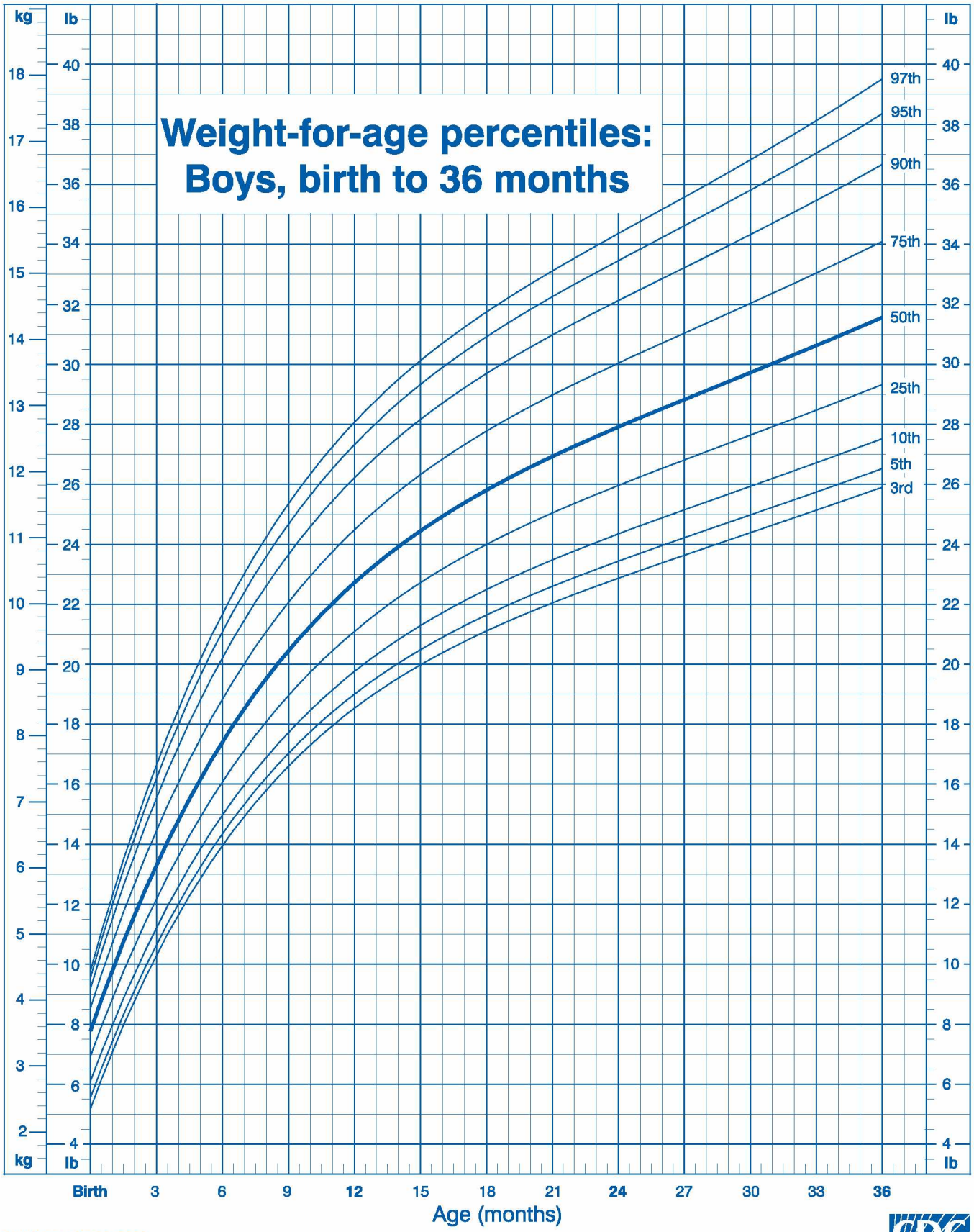
As the 2000 CDC Growth Charts are used in various applications, they will continue to be evaluated. Through this process, additional knowledge will be gained to give direction for future improvements in pediatric growth charts for the United States.

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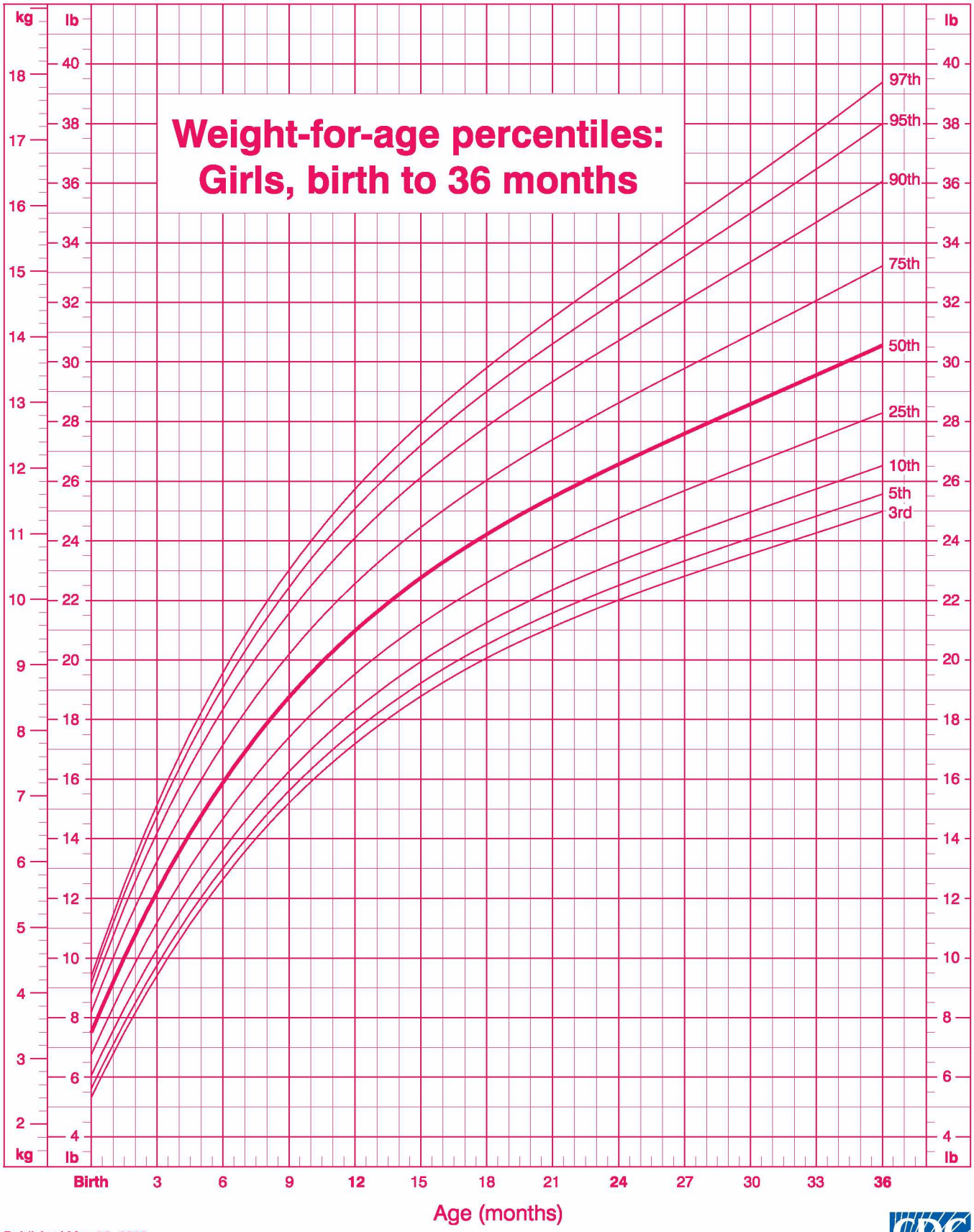


Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 1. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Boys weight-for-age

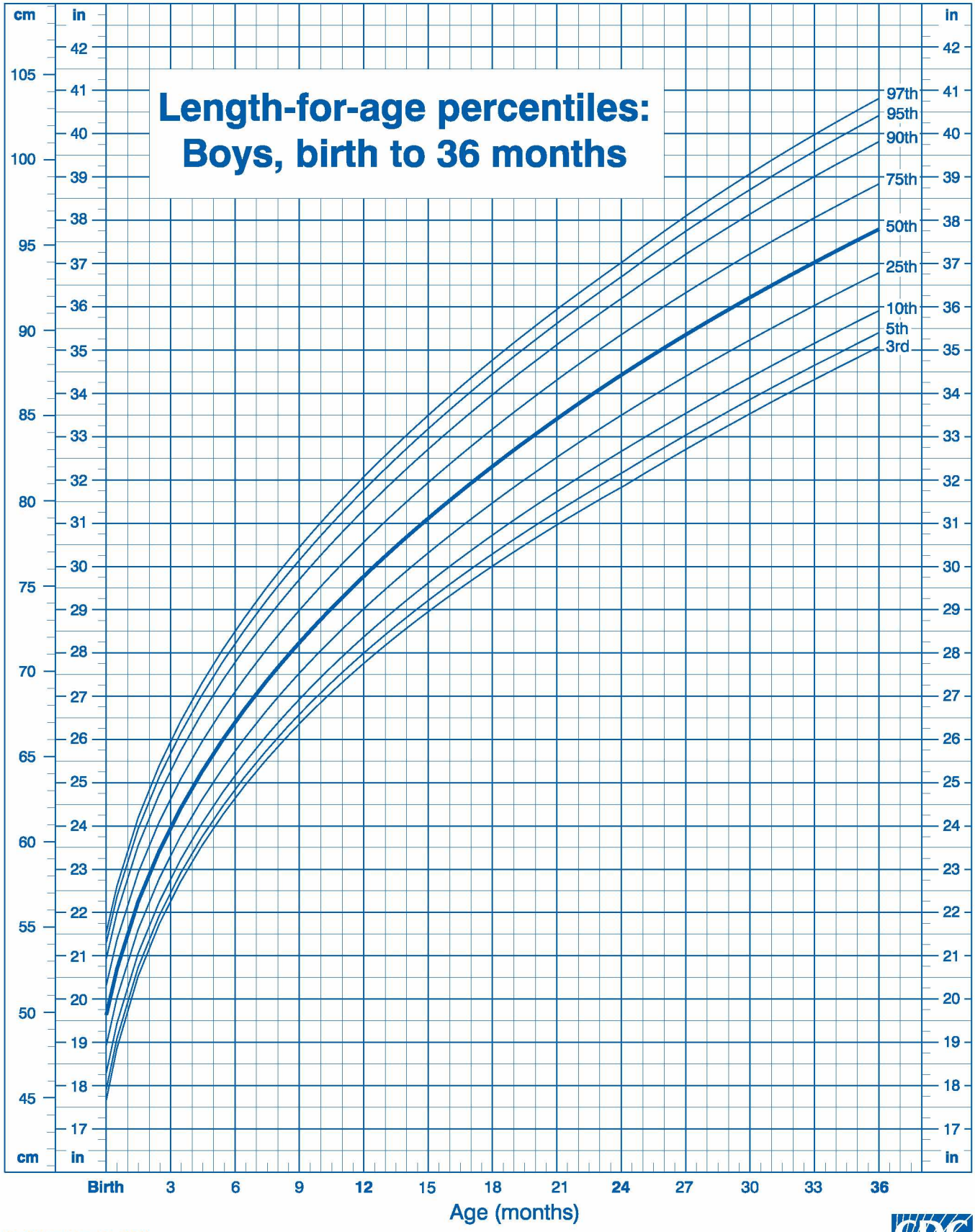


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Figure 2. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Girls weight-for-age

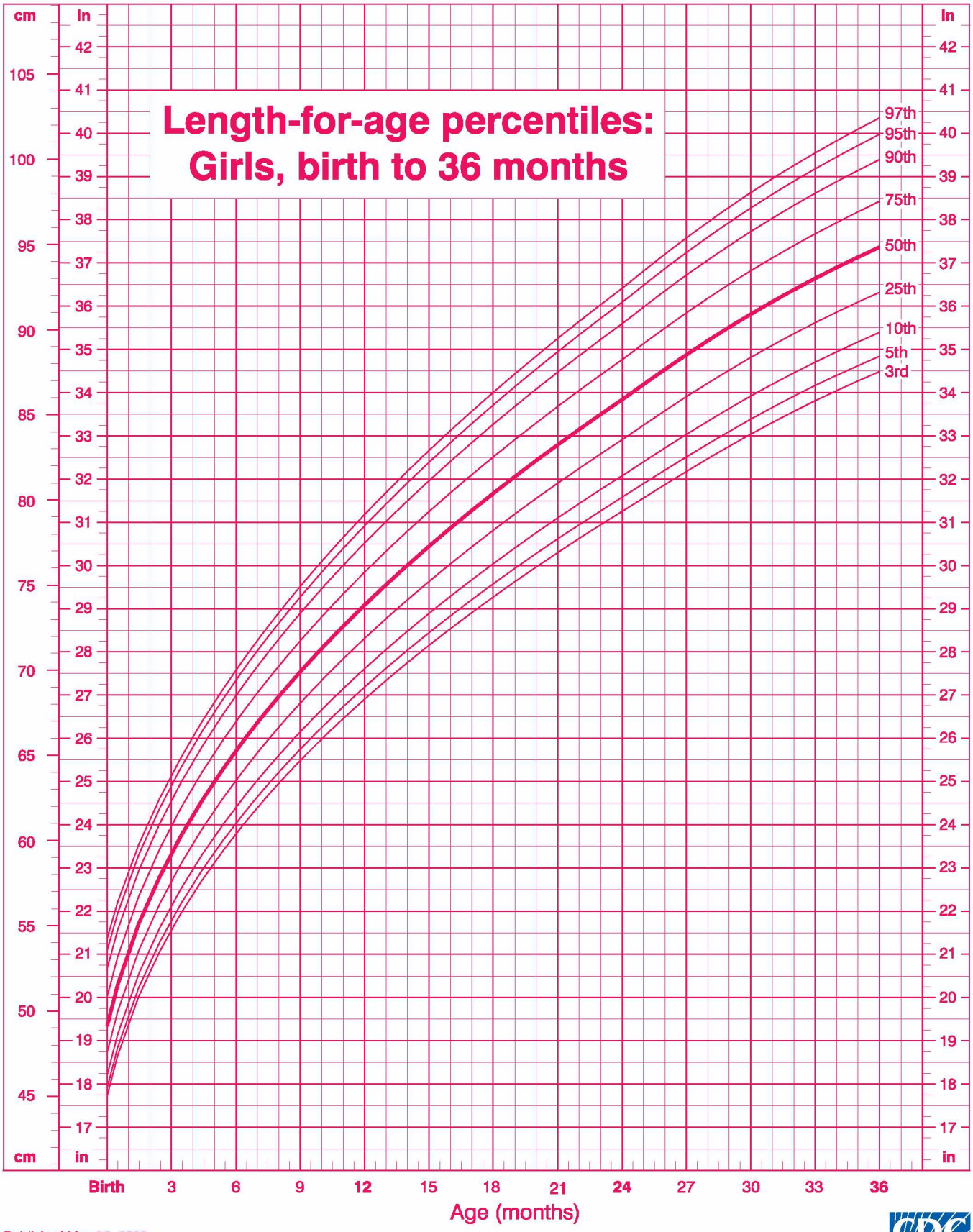


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Figure 3. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Boys length-for-age



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 4. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Girls length-for-age

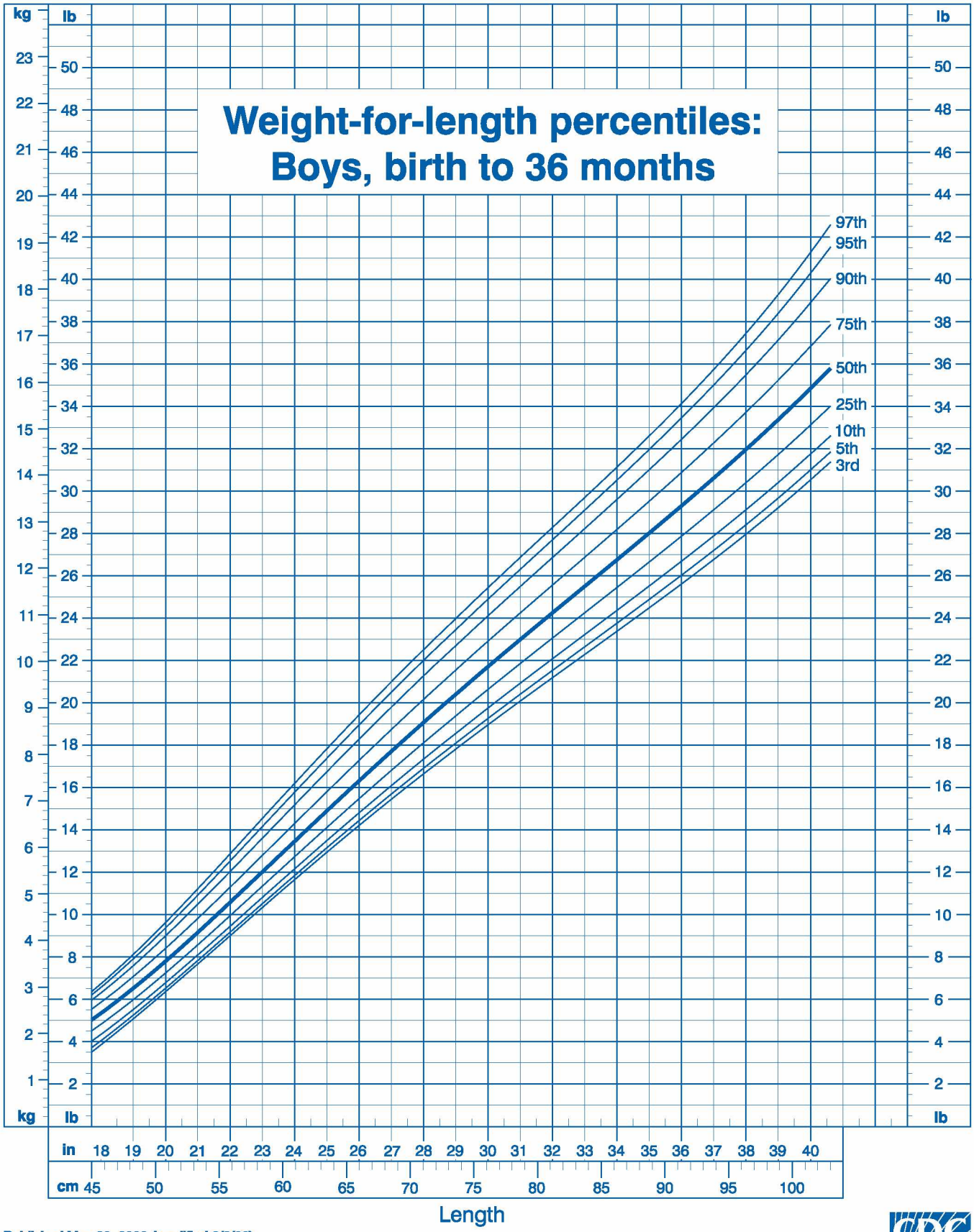
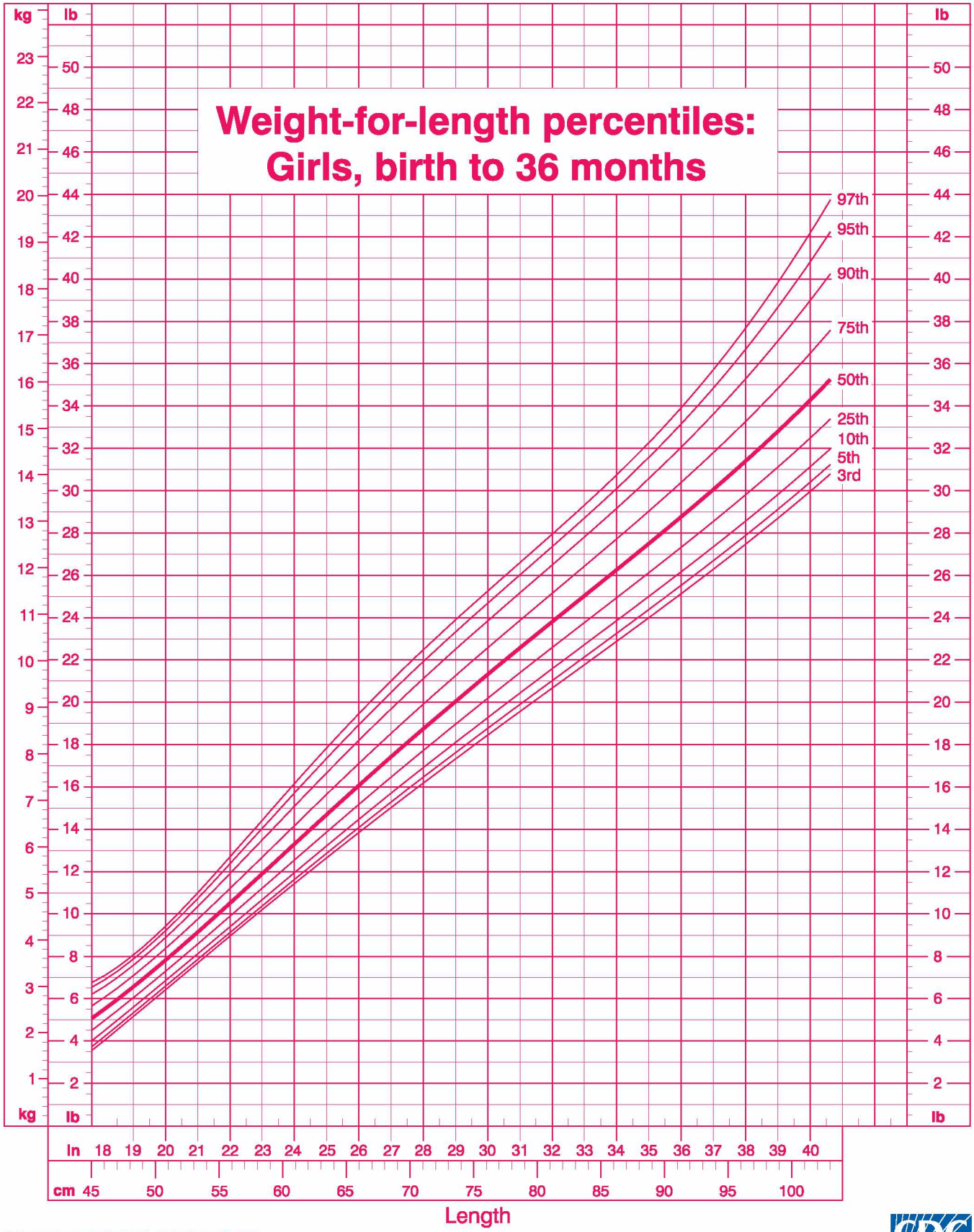


Figure 5. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Boys weight-for-length

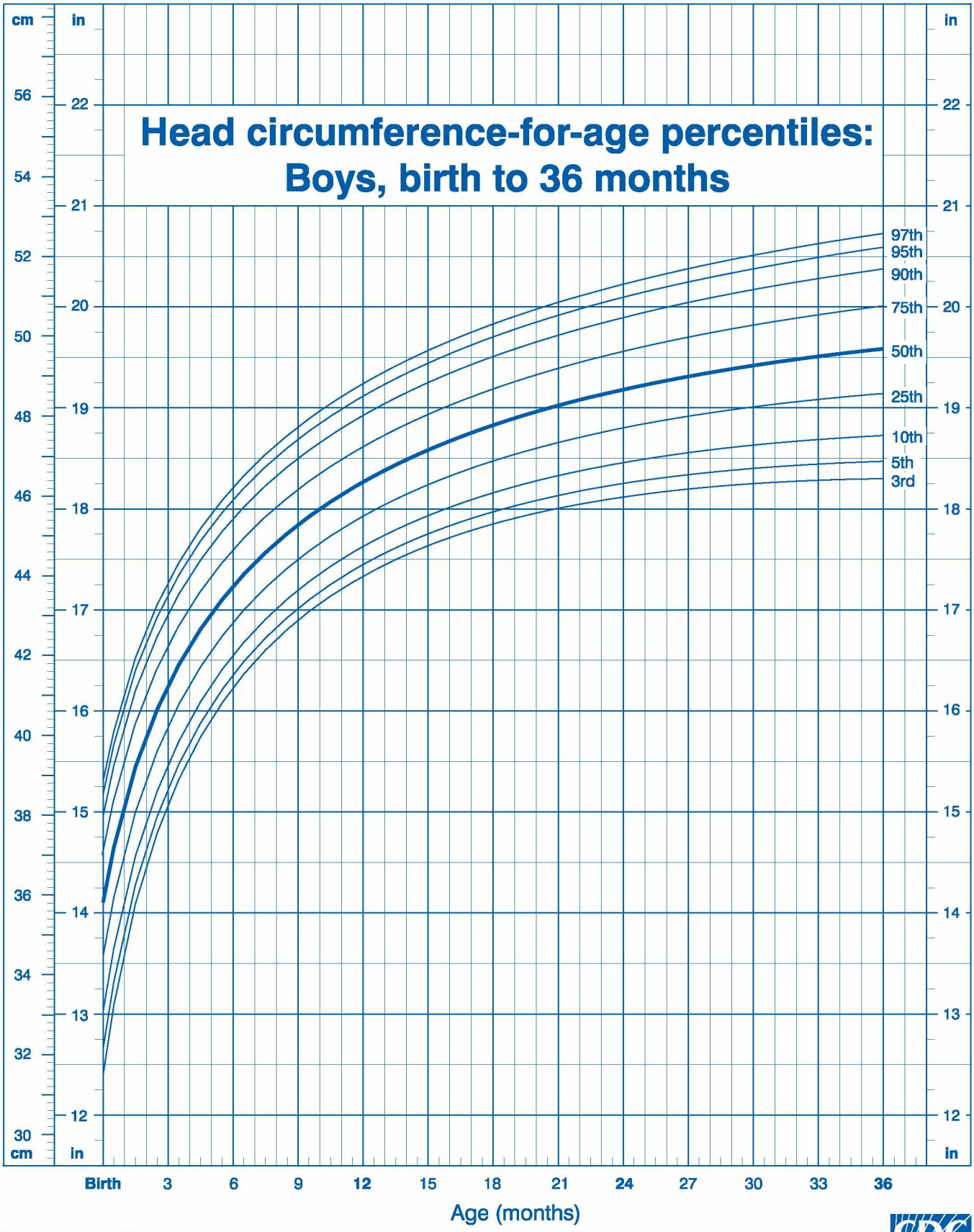


Published May 30, 2000. (modified 6/8/00)

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 6. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Girls weight-for-length

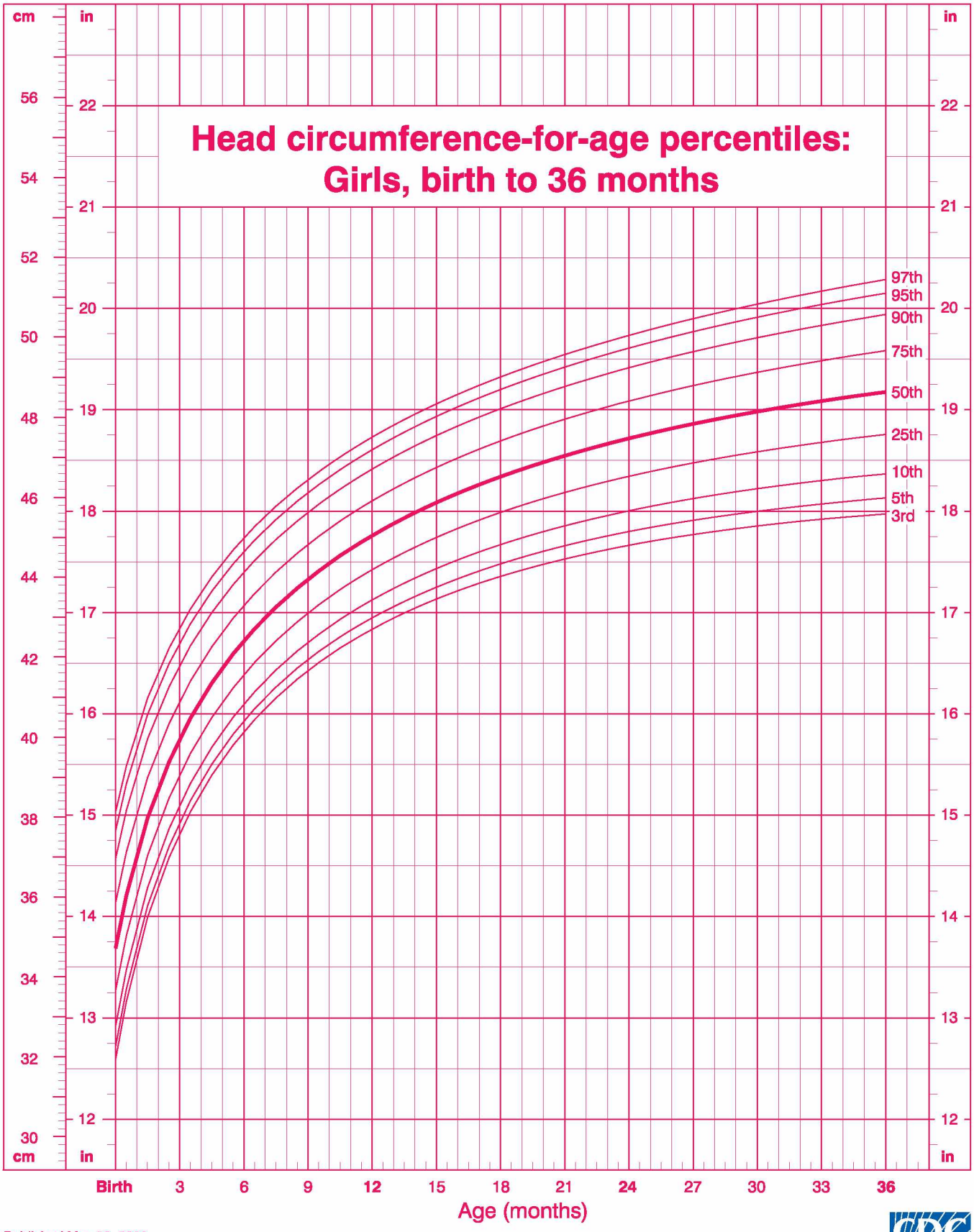


Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 7. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Boys head circumference-for-age



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 8. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, birth to 36 months: Girls head circumference-for-age

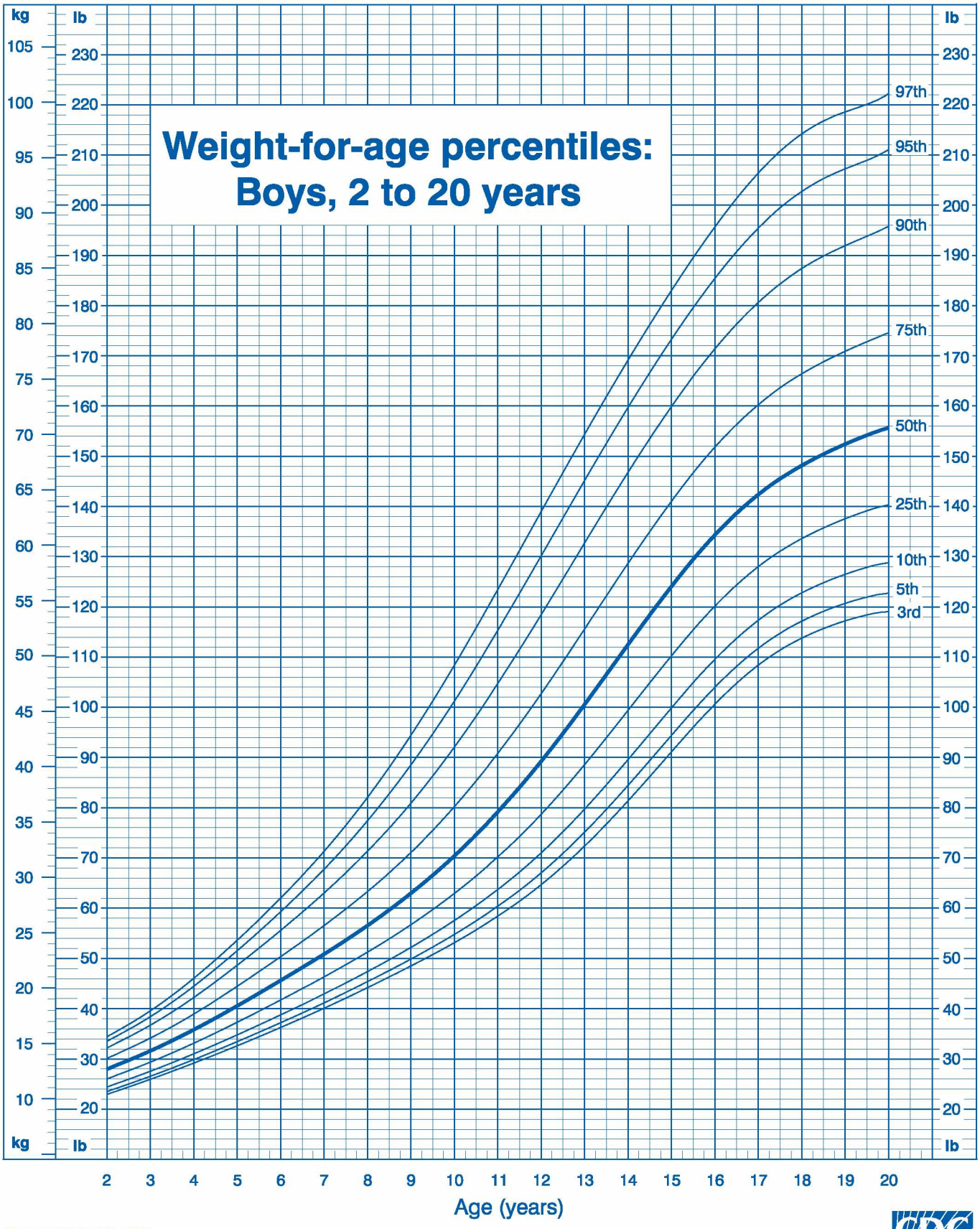
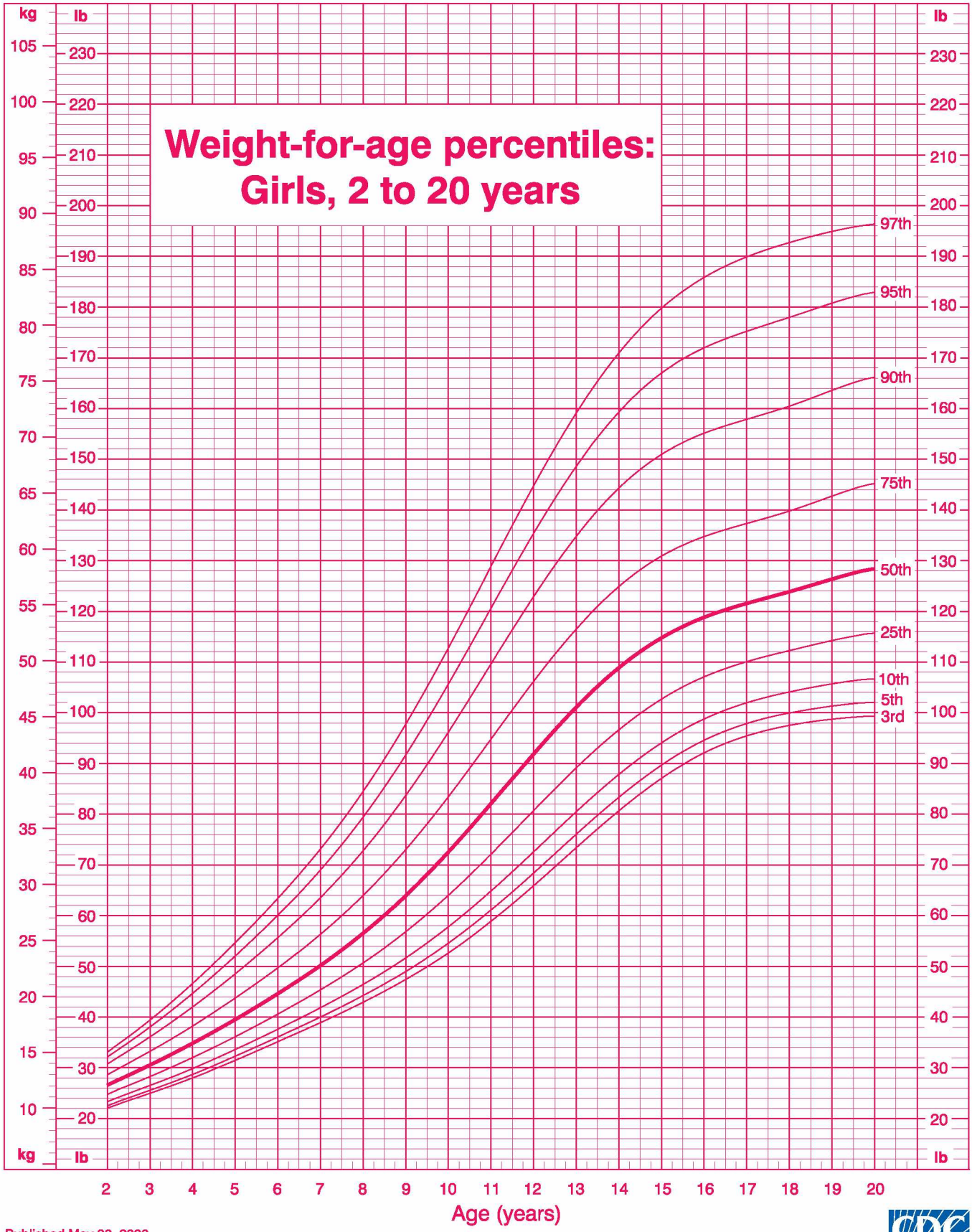


Figure 9. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, 2 to 20 years: Boys weight-for-age



Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 10. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, 2 to 20 years: Girls weight-for-age

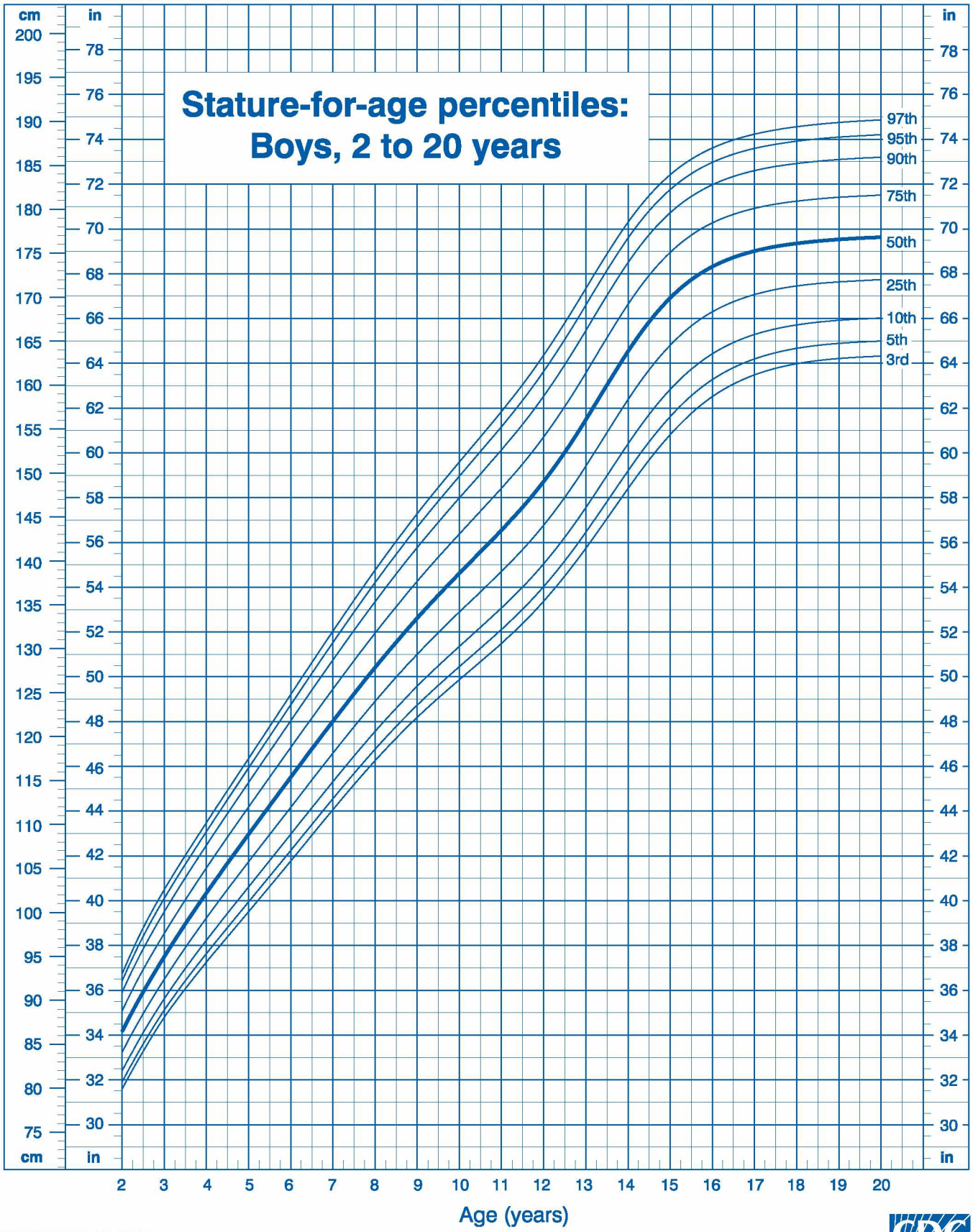


Figure 11. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, 2 to 20 years: Boys stature-for-age

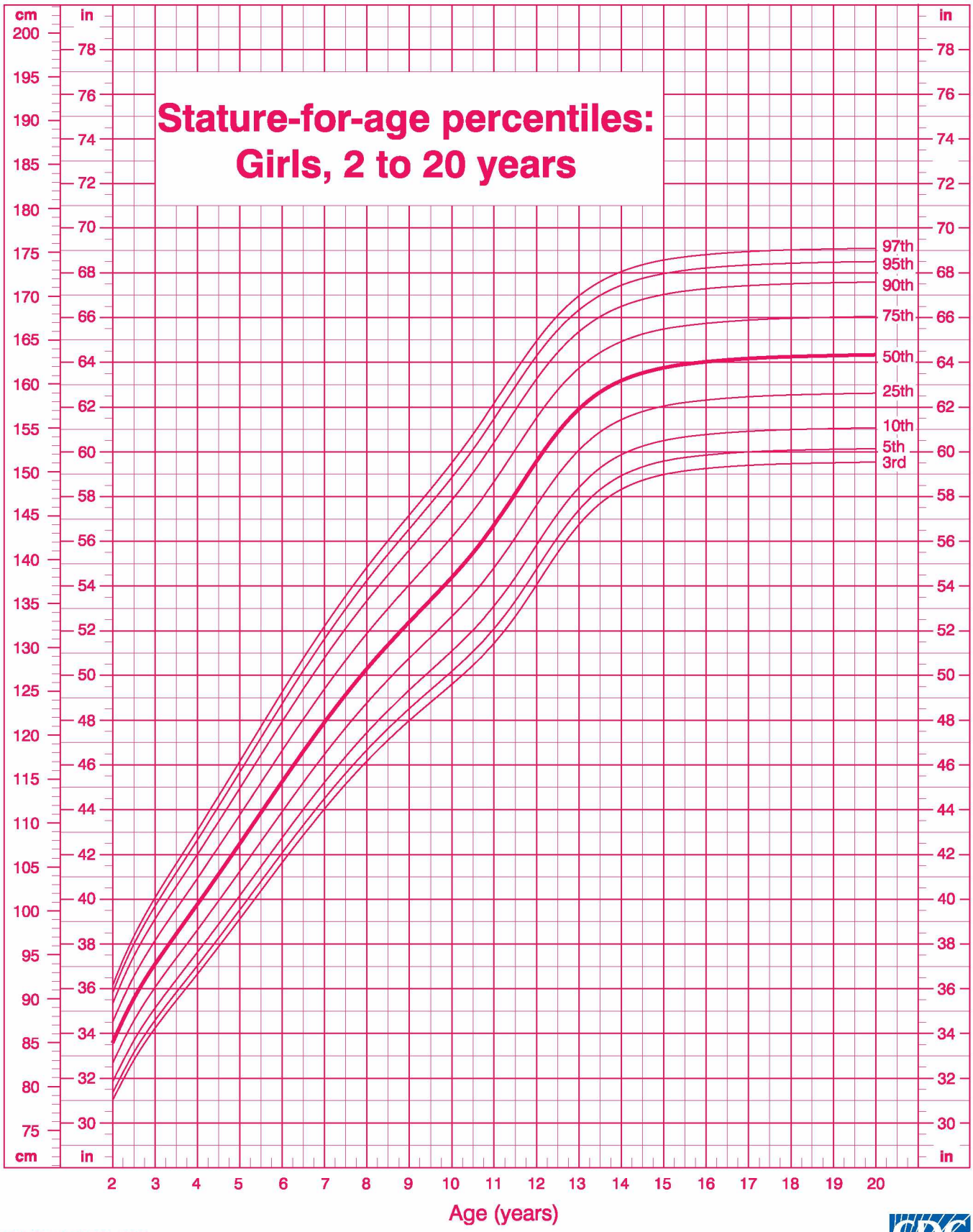
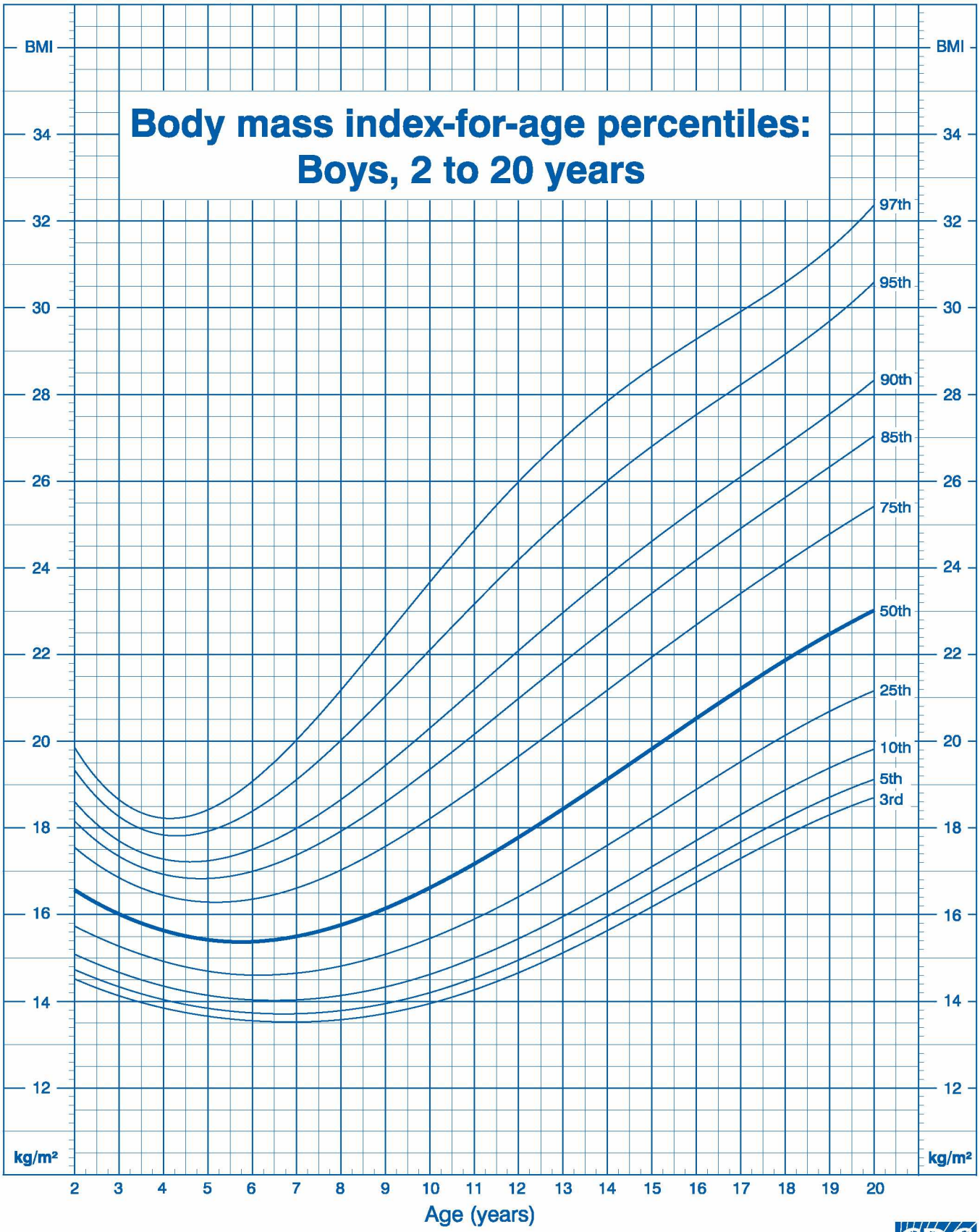


Figure 12. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, 2 to 20 years: Girls stature-for-age

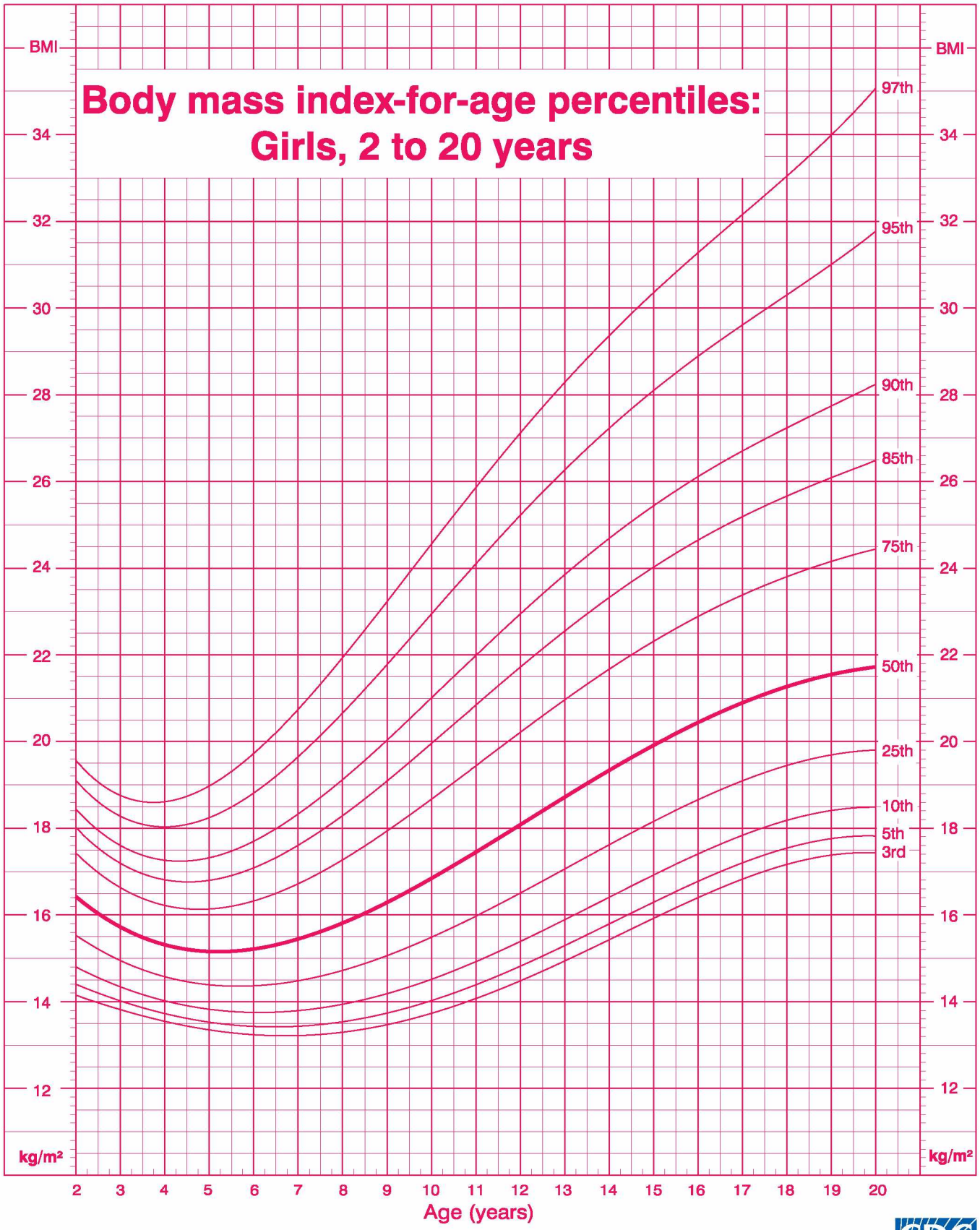


Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion

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Figure 13. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles, 2 to 20 years: Boys body mass index-for-age

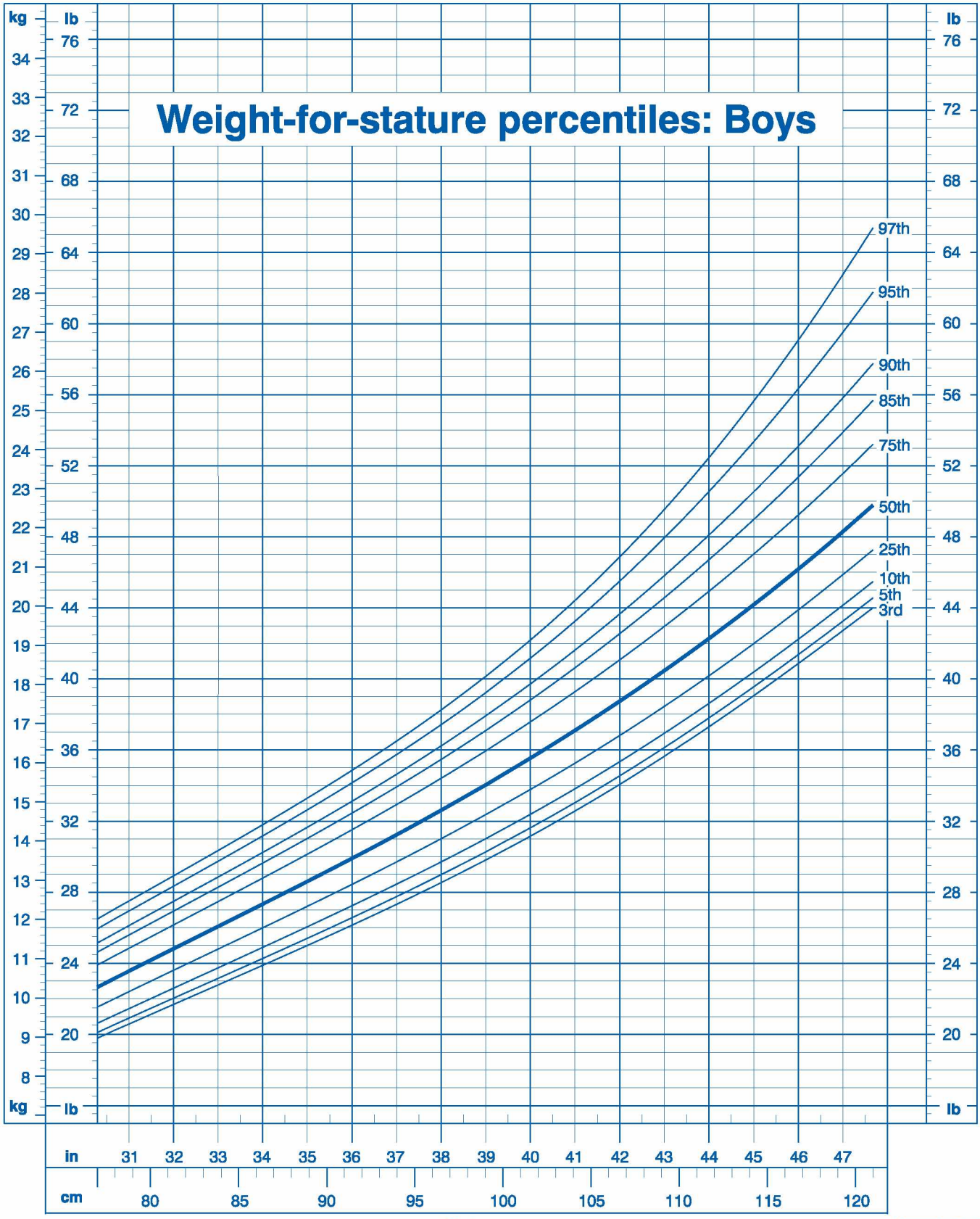


Published May 30, 2000.

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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Figure 14. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th, 97th percentiles, 2 to 20 years: Girls body mass index-for-age



Published May 30, 2000 (modified 11/21/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion

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Figure 15. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th, 97th percentiles: Boys weight-for-stature

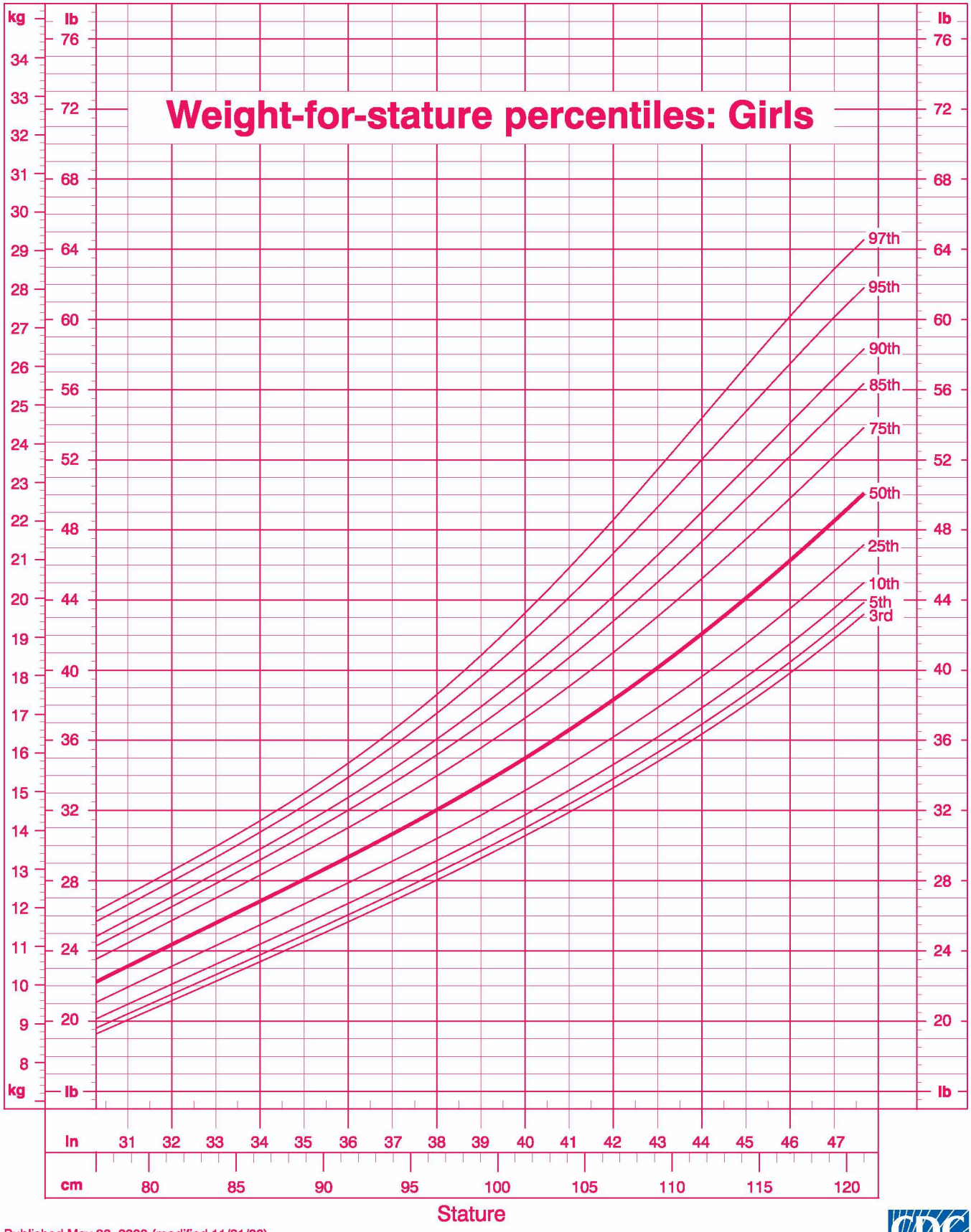


Figure 16. Individual growth chart 3rd, 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th, 97th percentiles: Girls weight-for-stature

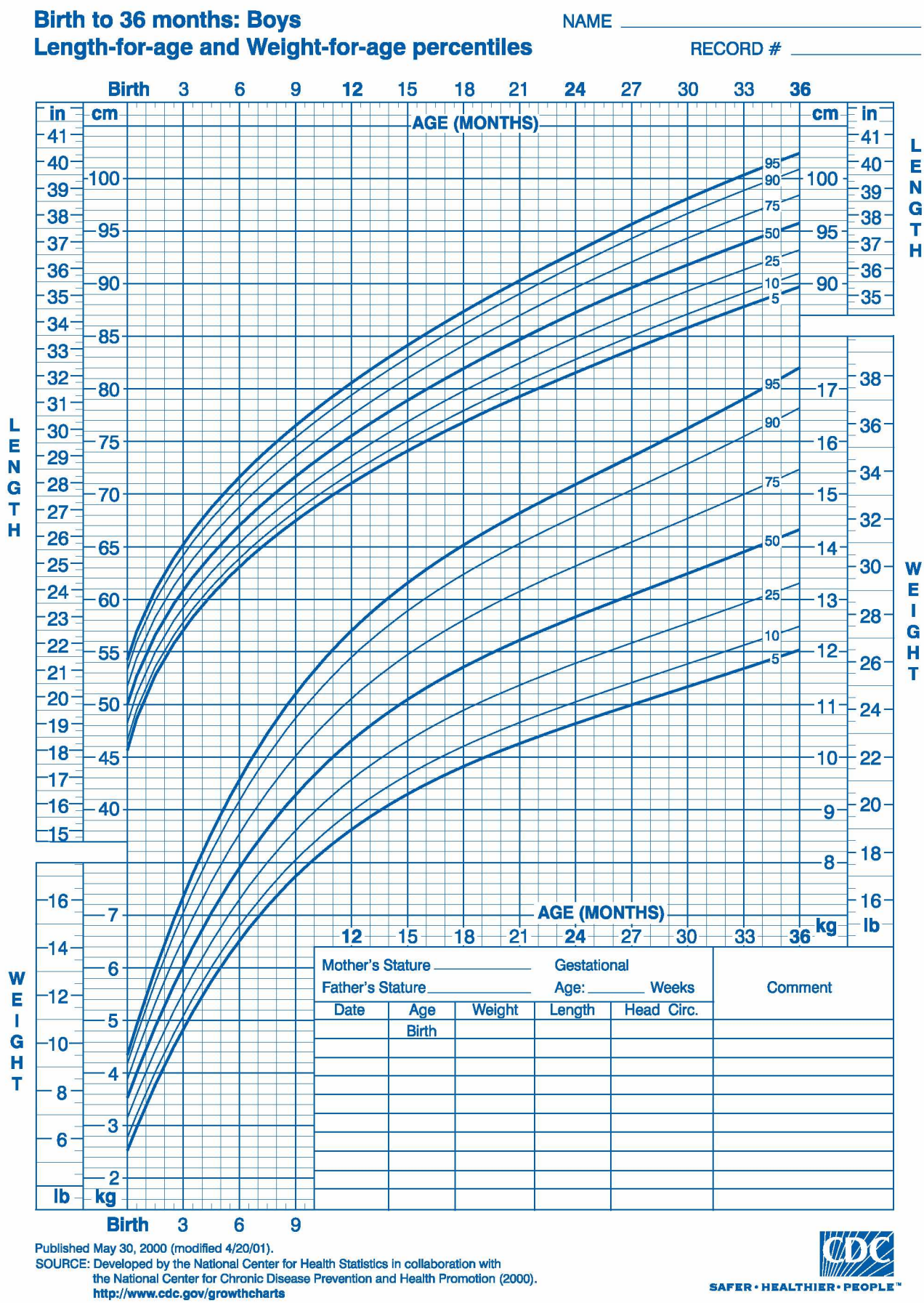


Figure 17. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, birth to 36 months: Boys length-for-age and weight-for-age percentiles

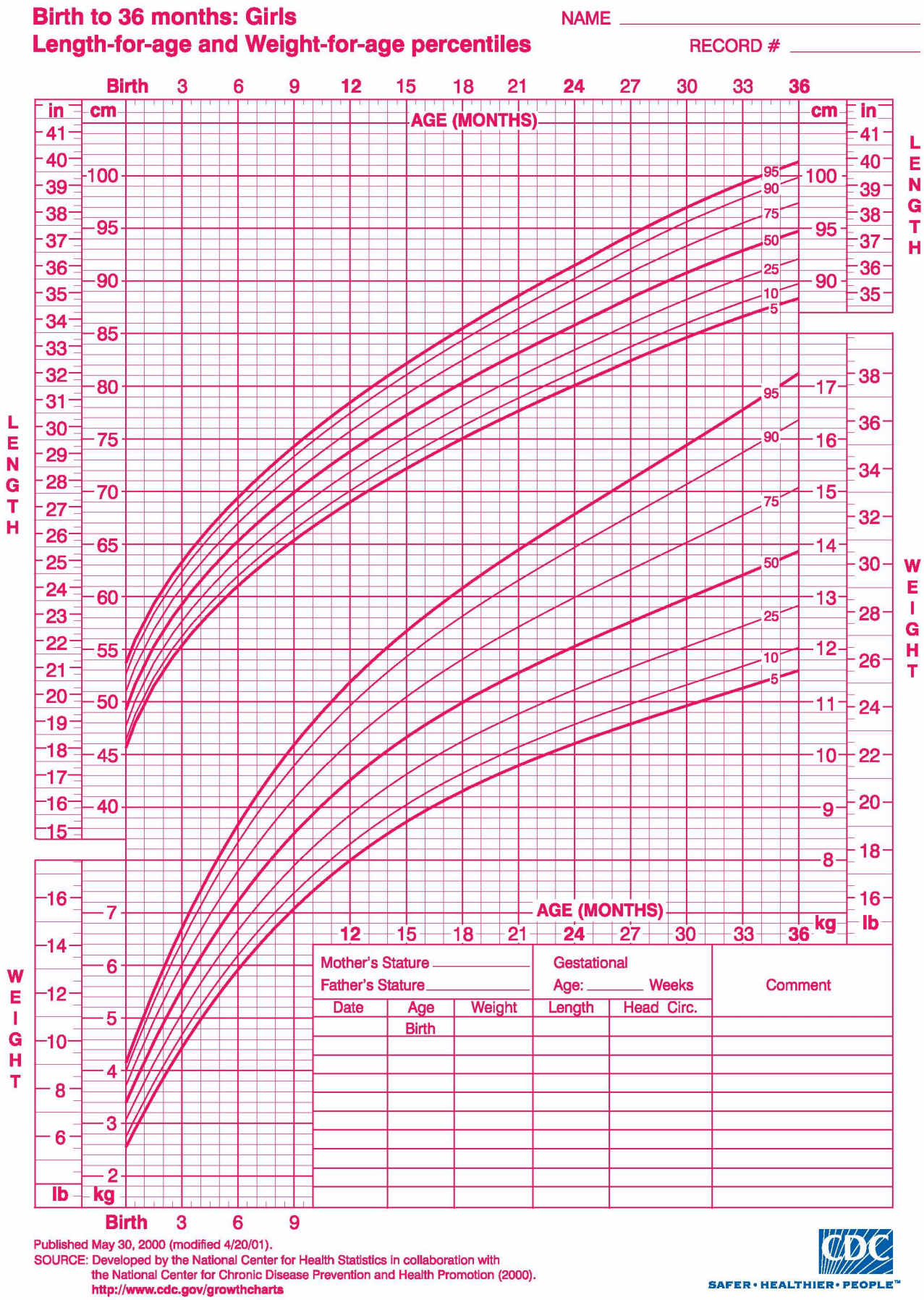


Figure 18. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, birth to 36 months: Girls length-for-age and weight-for-age percentiles

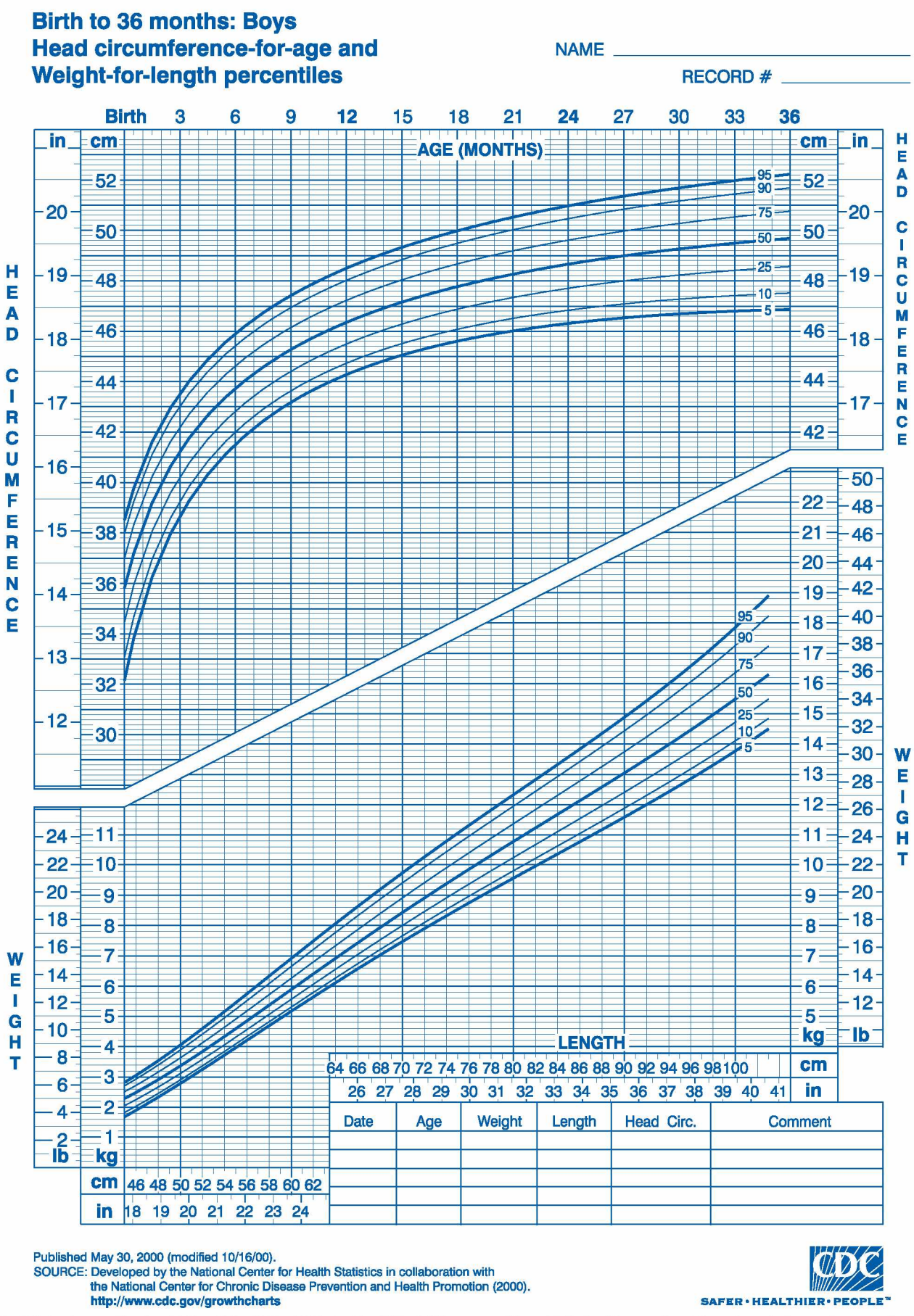


Figure 19. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, birth to 36 months: Boys head circumference-for-age and weight-for-length

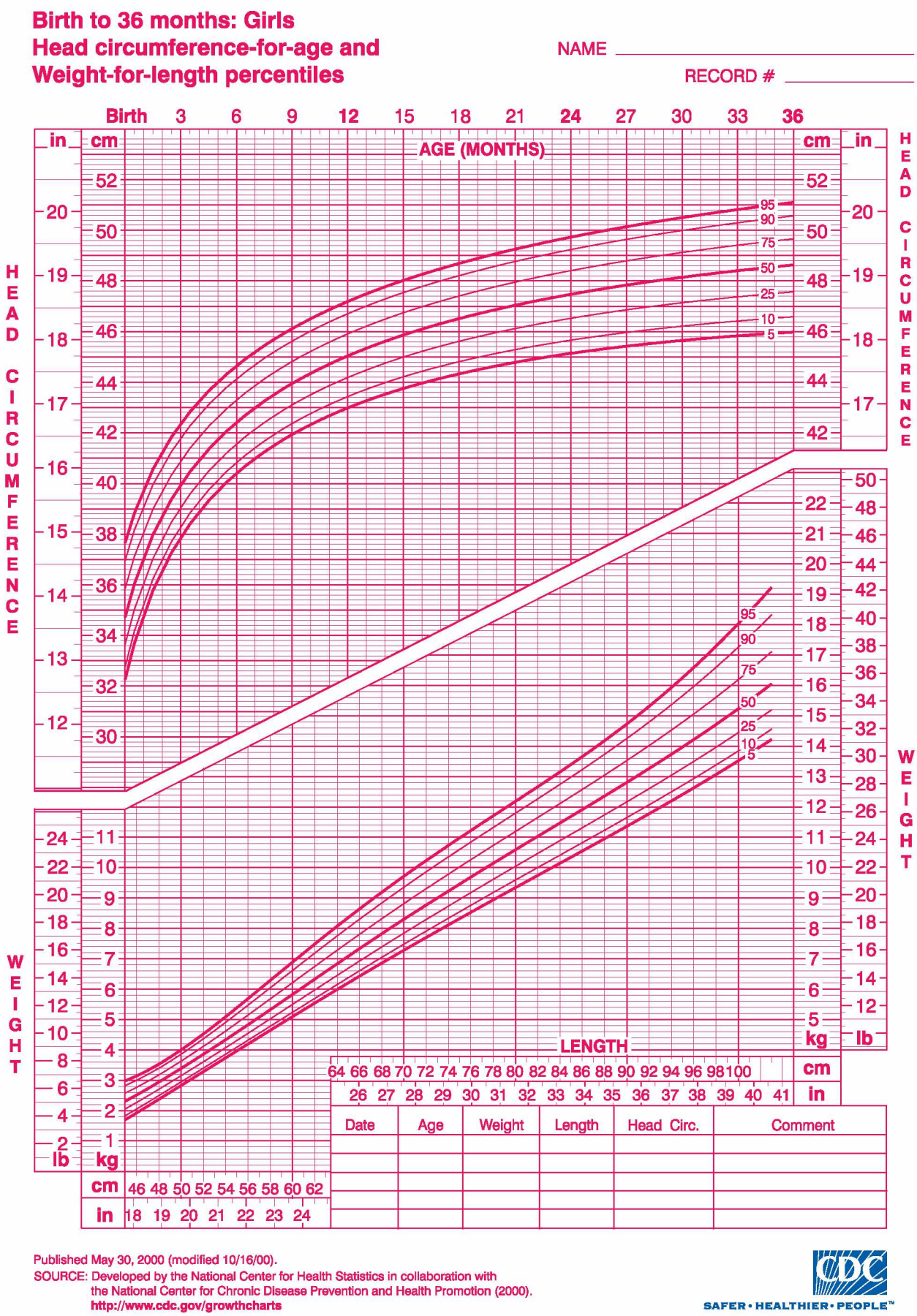


Figure 20. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, birth to 36 months: Girls head circumference-for-age and weight-for-length

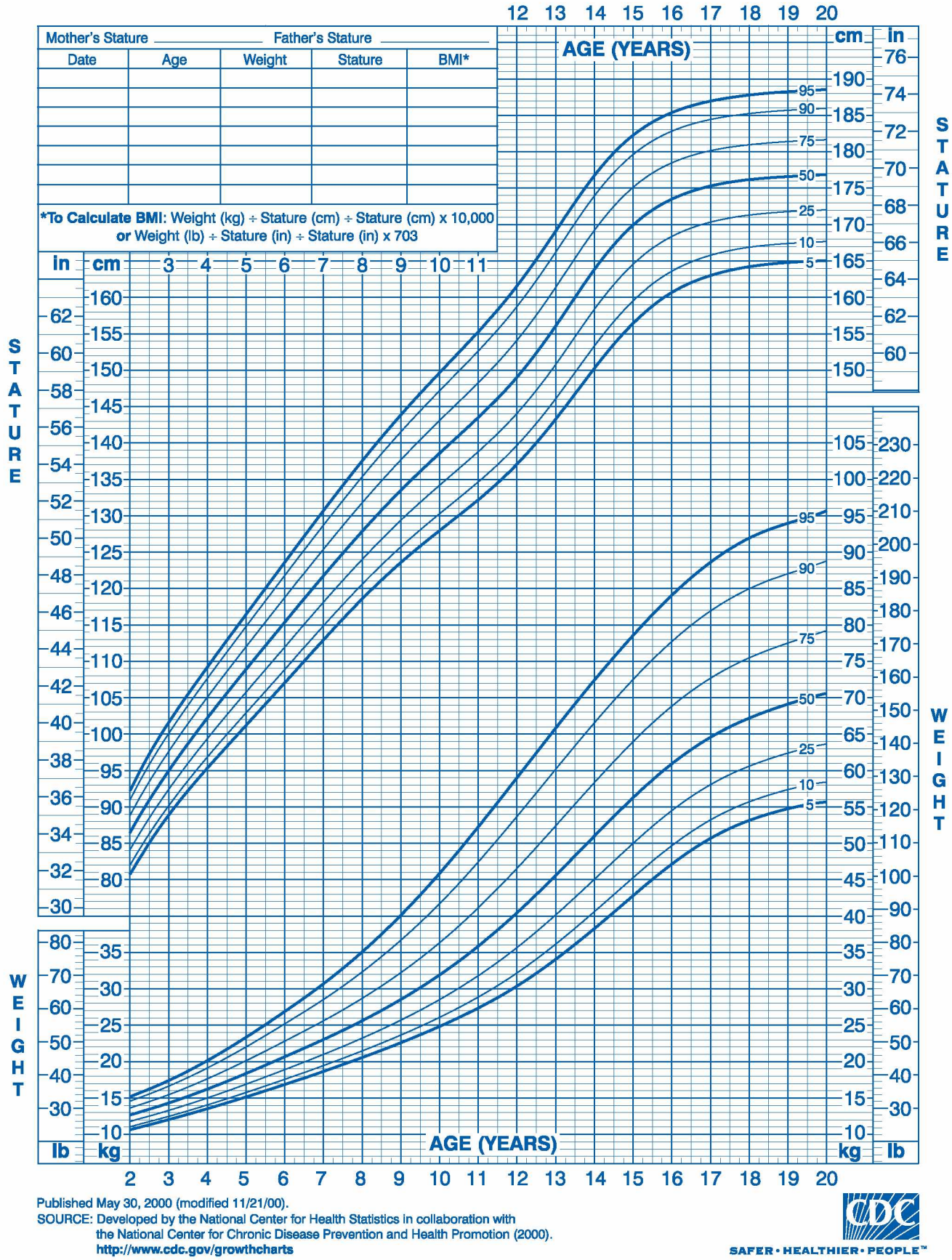


Figure 21. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, 2 to 20 years: Boys stature-for-age and weight-for-age



Figure 22. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 90th, 95th percentiles, 2 to 20 years: Girls stature-for-age and weight-for-age

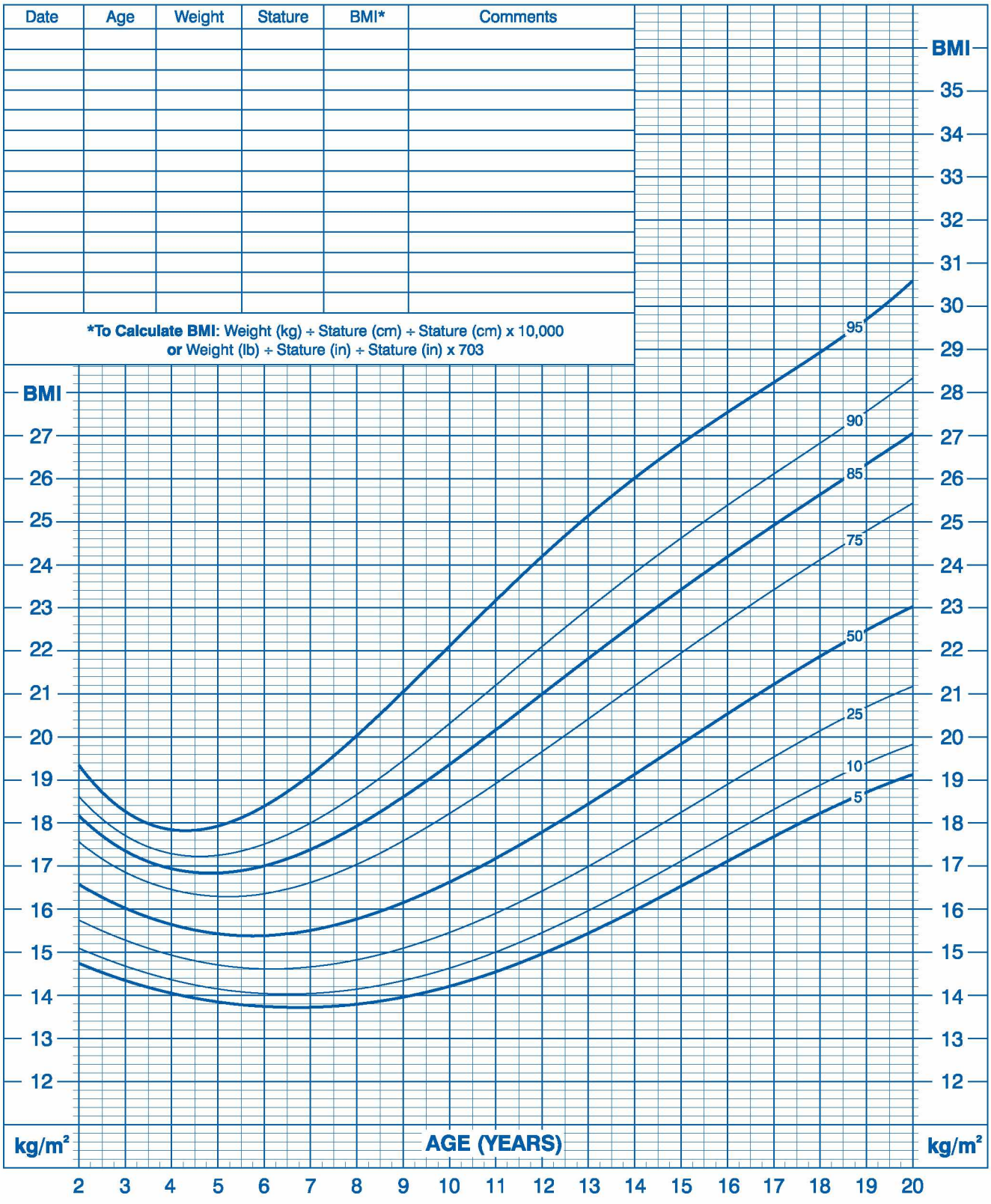
2 to 20 years: Boys
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI:** Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).

SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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Figure 23. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th percentiles, 2 to 20 years: Boys body mass index-for-age

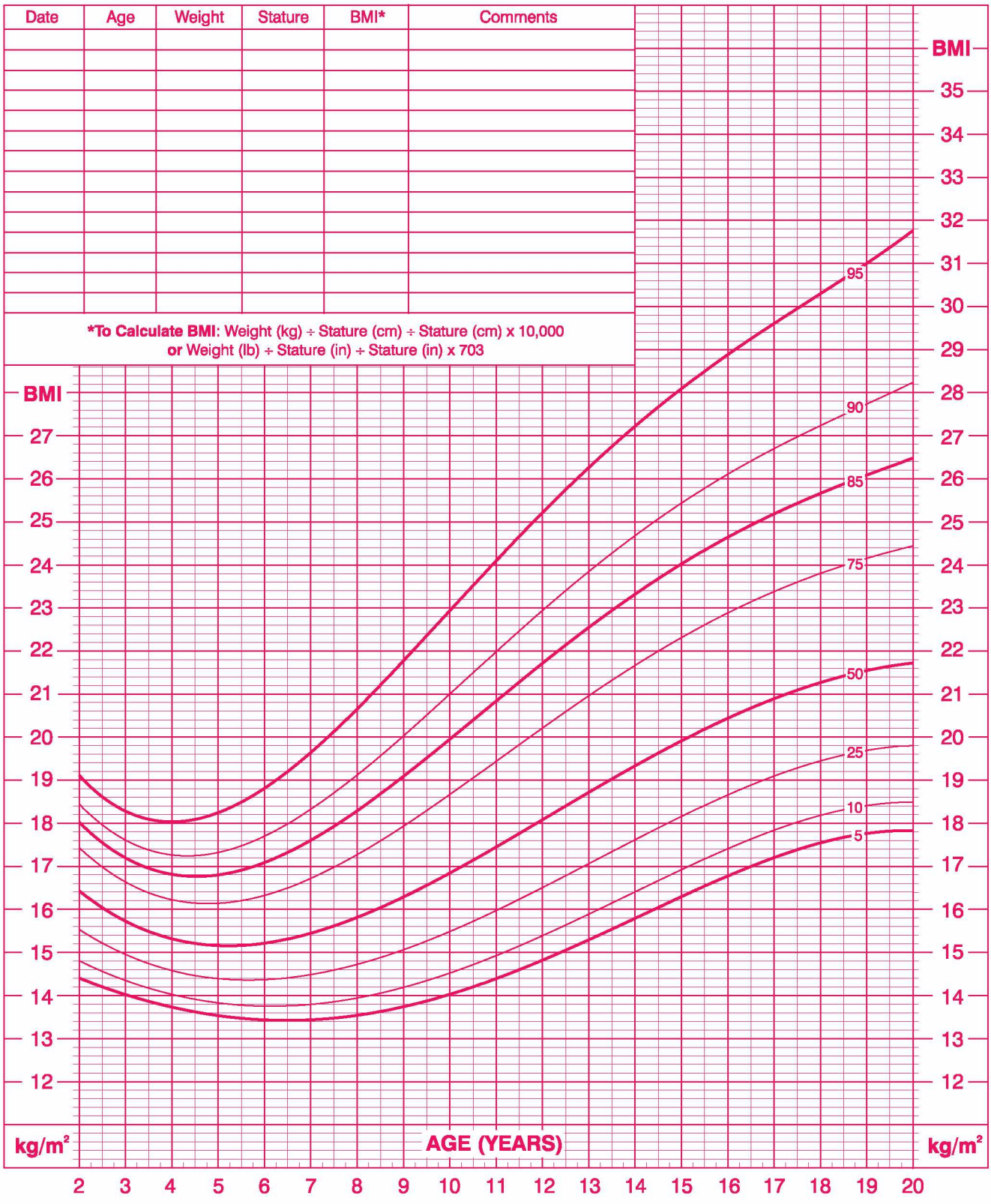
2 to 20 years: Girls
Body mass index-for-age percentiles

NAME _____

RECORD # _____

Date	Age	Weight	Stature	BMI*	Comments

***To Calculate BMI:** Weight (kg) ÷ Stature (cm) ÷ Stature (cm) x 10,000
or Weight (lb) ÷ Stature (in) ÷ Stature (in) x 703



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

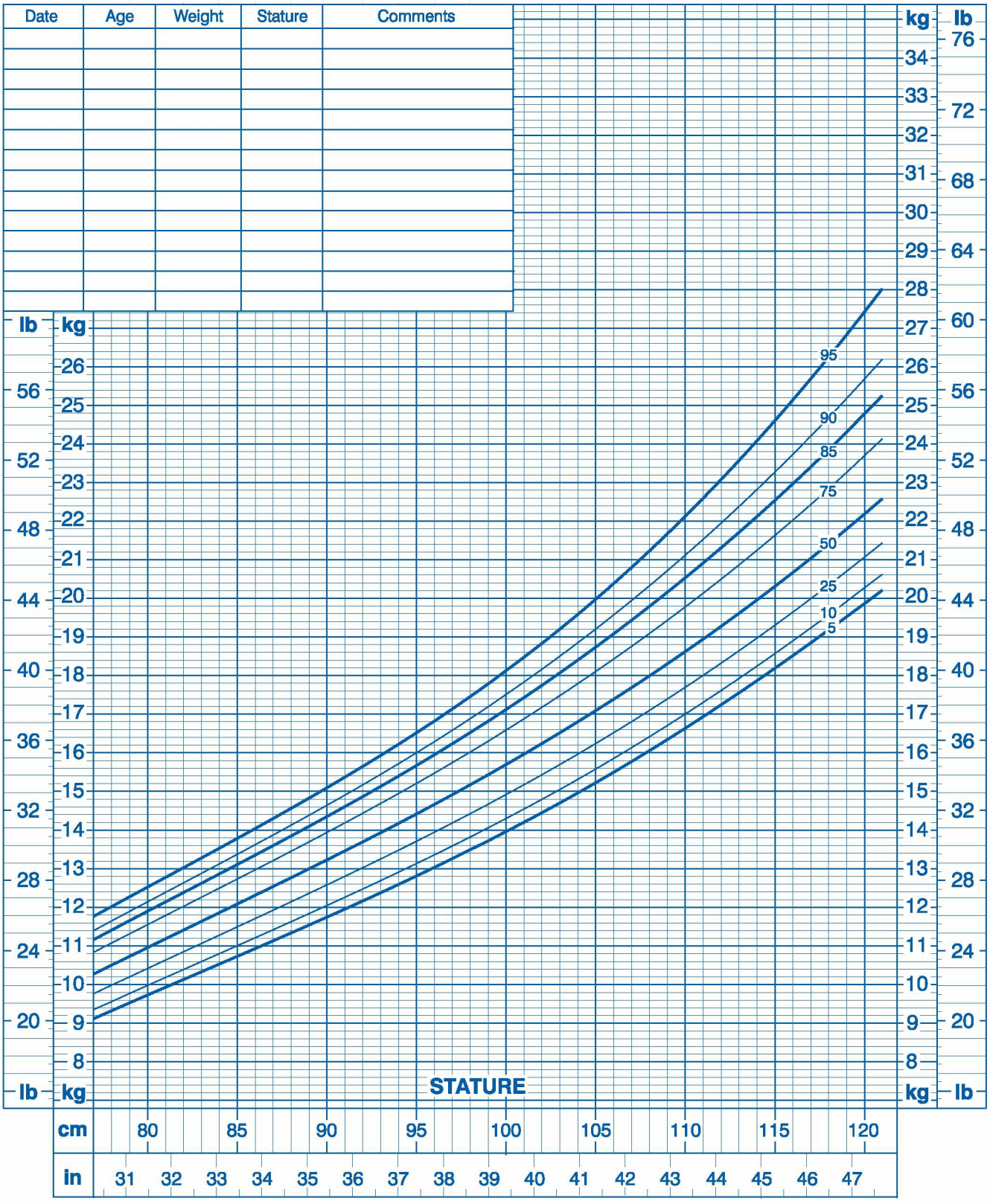
CDC SAFER • HEALTHIER • PEOPLE™

Figure 24. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th percentiles, 2 to 20 years: Girls body mass index-for-age

NAME _____

Weight-for-stature percentiles: Boys

RECORD # _____



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

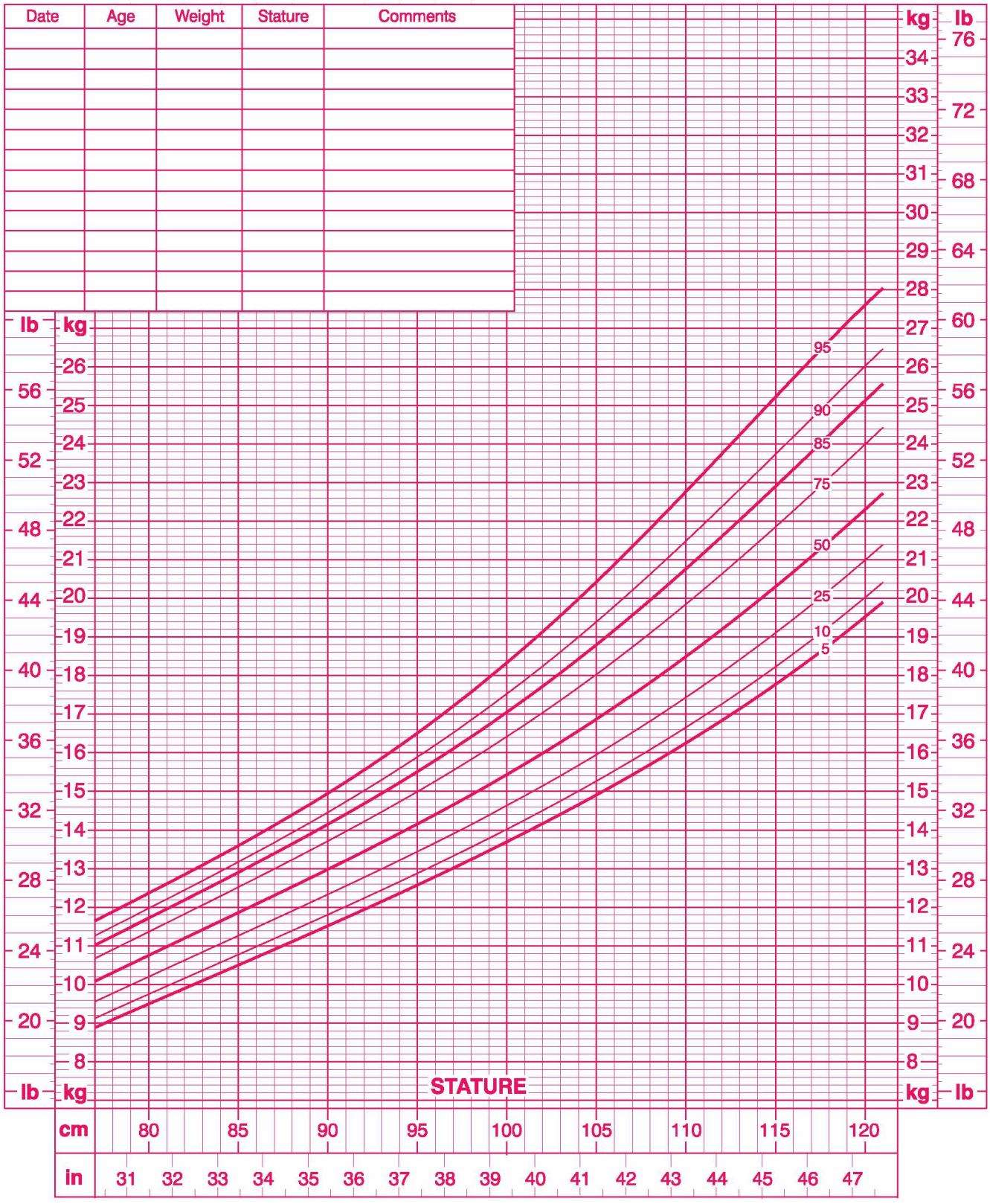
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Figure 25. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th percentiles: Boys weight-for-stature

NAME _____

Weight-for-stature percentiles: Girls

RECORD # _____



Published May 30, 2000 (modified 10/16/00).
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).
http://www.cdc.gov/growthcharts

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Figure 26. Clinical growth chart 5th, 10th, 25th, 50th, 75th, 85th, 90th, 95th percentiles: Girls weight-for-stature

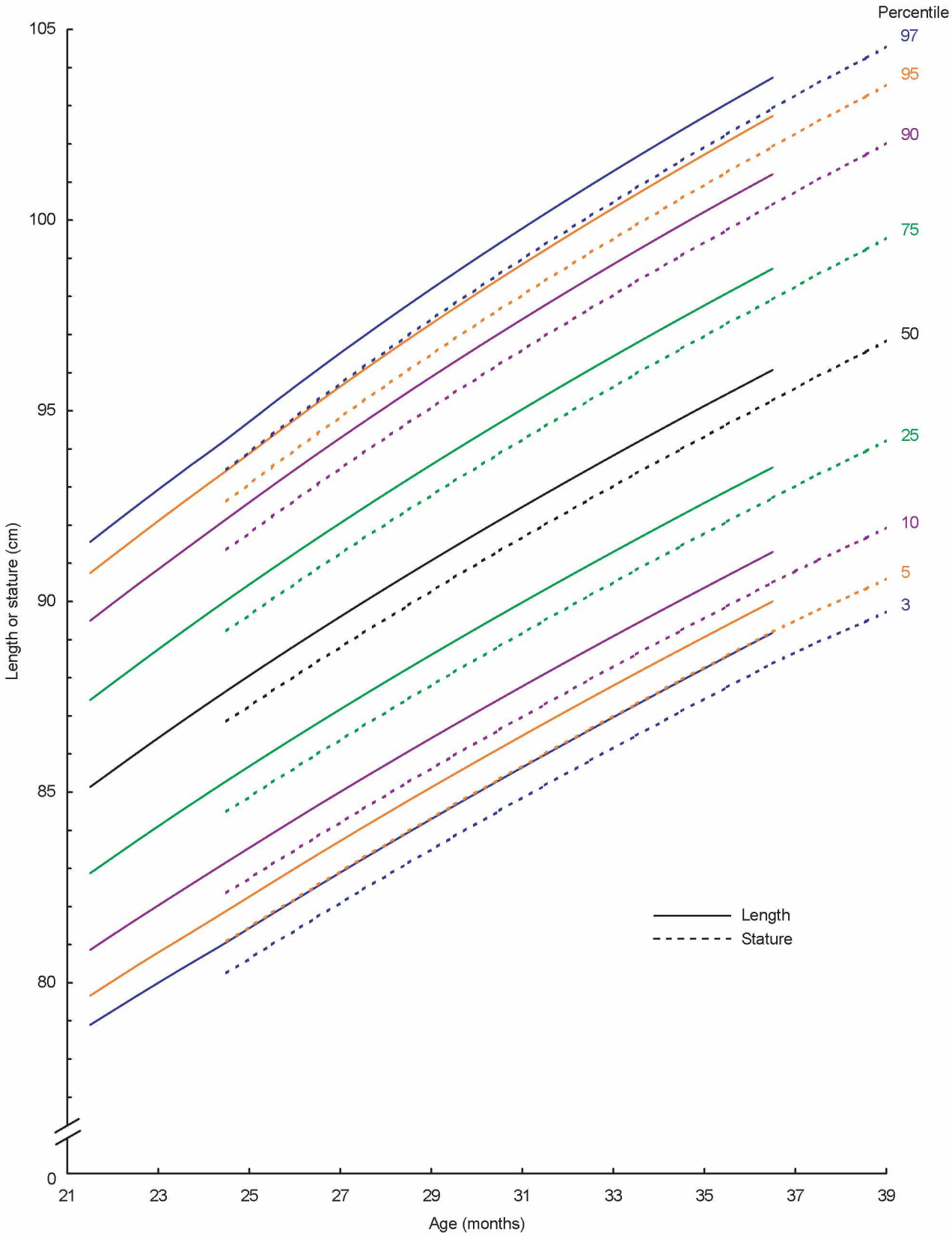


Figure 27. Smoothed percentile curves, 22–39 months: Boys length-for-age and stature-for-age

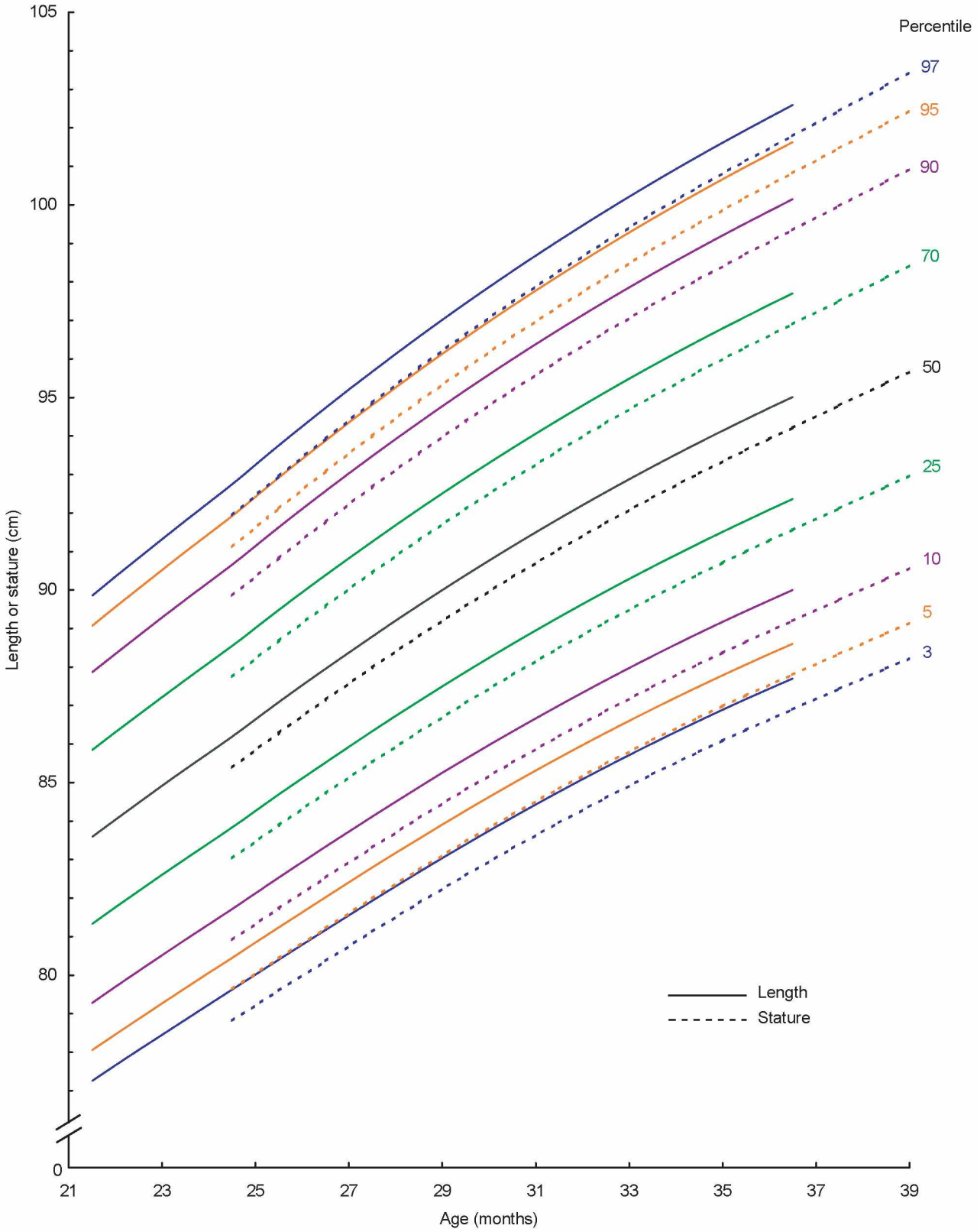


Figure 28. Smoothed percentile curves, 22–39 months: Girls length-for-age and stature-for-age

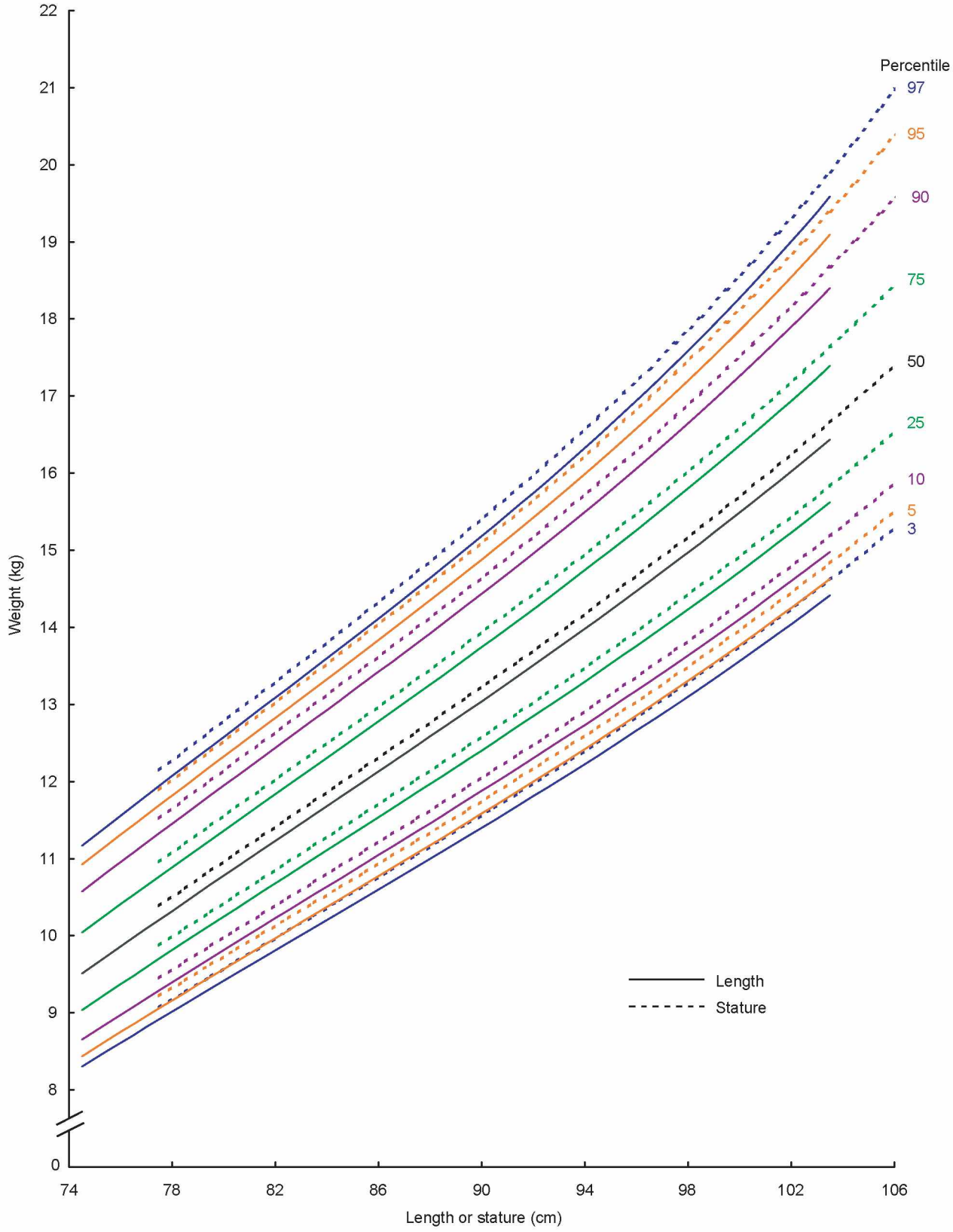


Figure 29. Smoothed percentile curves, 75–106 cm: Boys weight-for-length and weight-for-stature

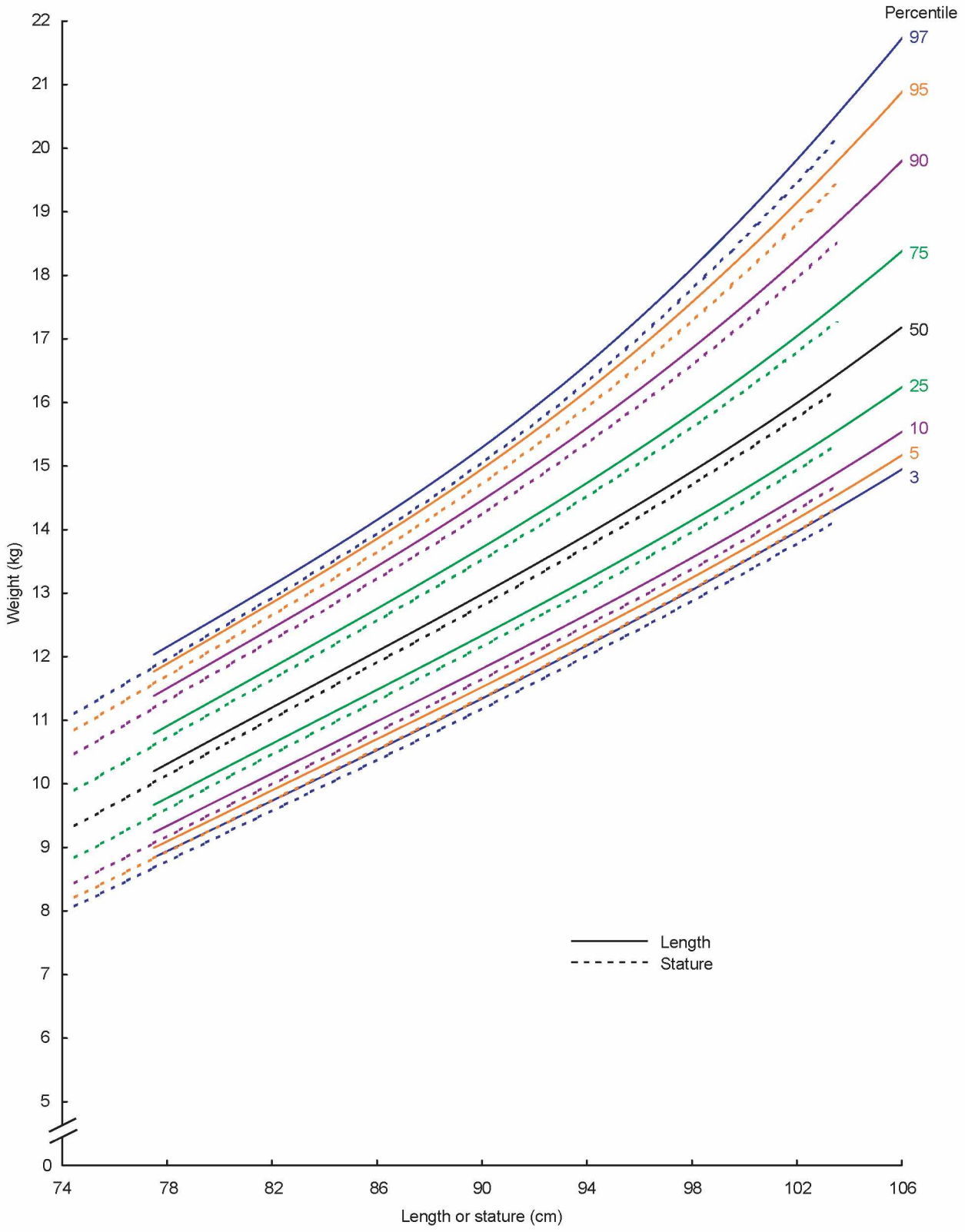


Figure 30. Smoothed percentile curves, 75–106 cm: Girls weight-for-length and weight-for-stature

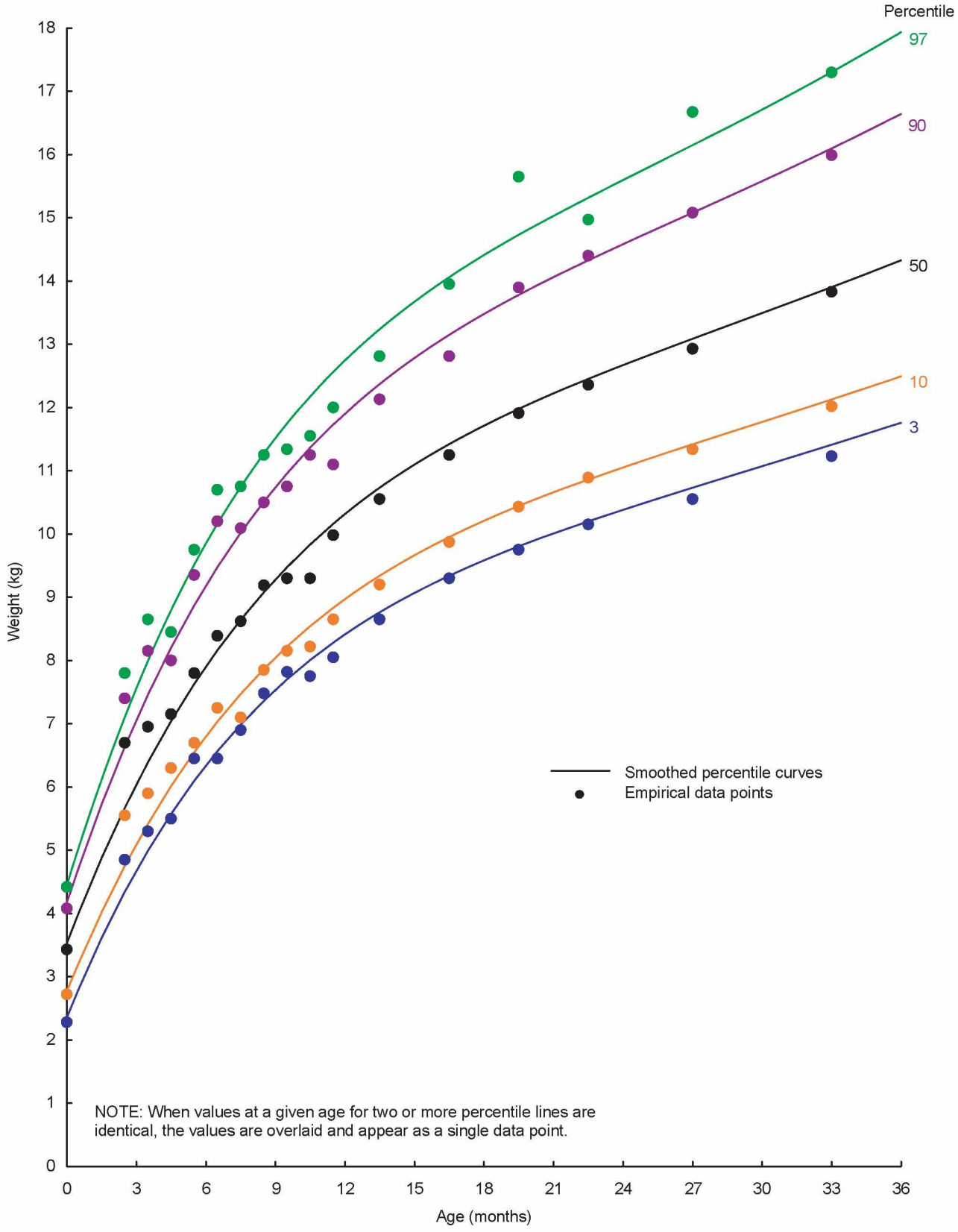


Figure 31. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Boys weight-for-age

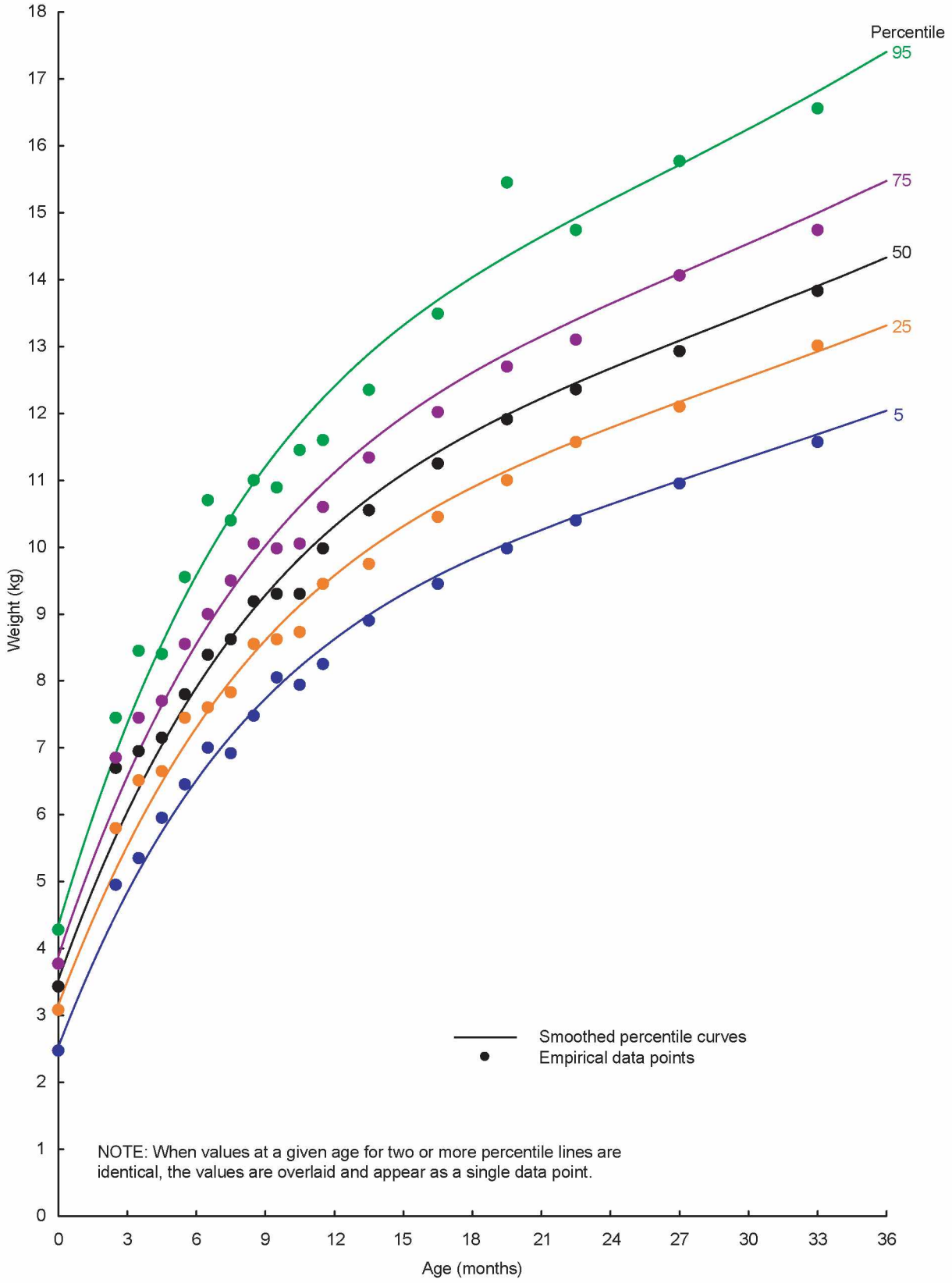


Figure 32. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Boys weight-for-age

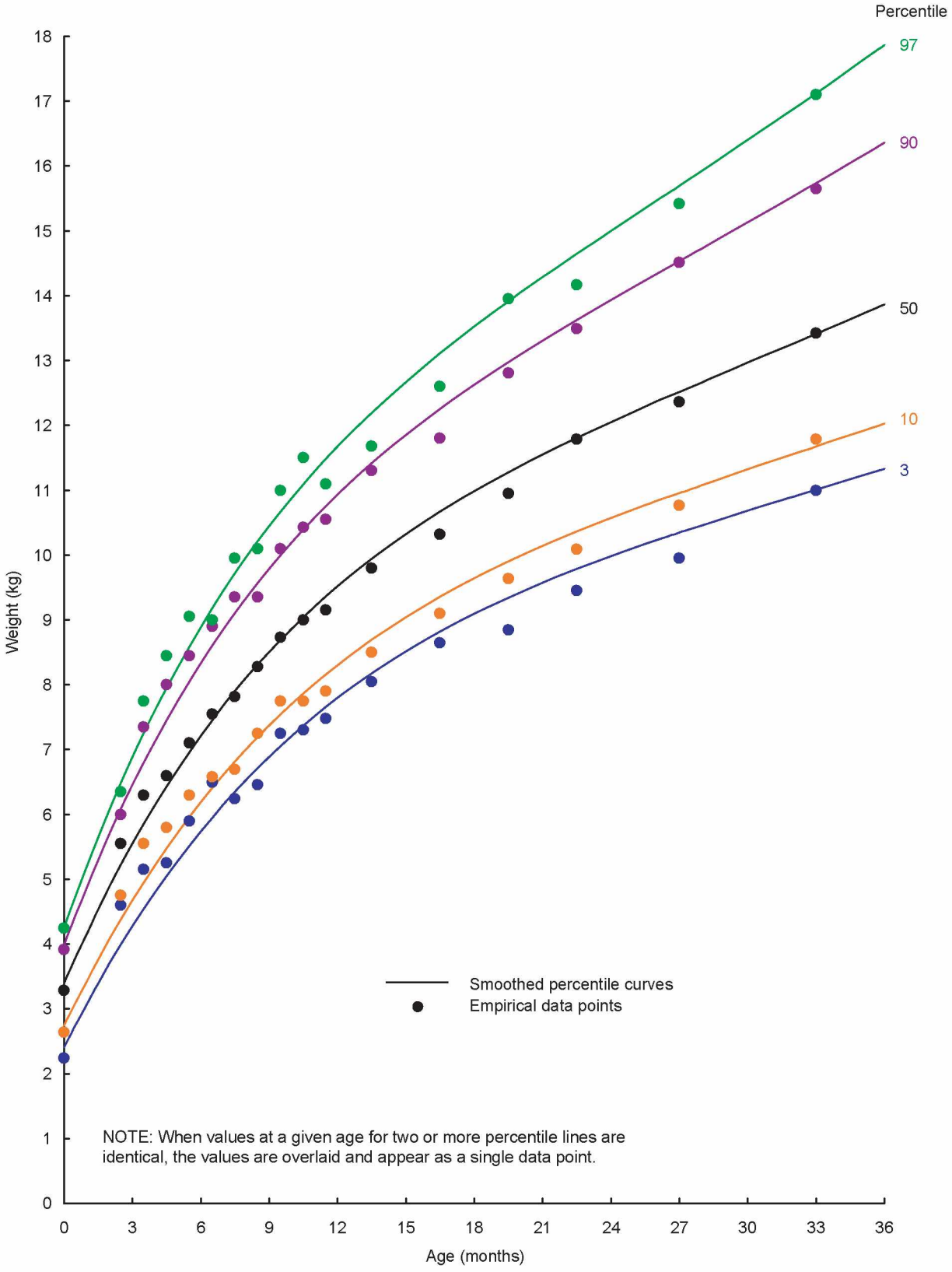


Figure 33. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Girls weight-for-age

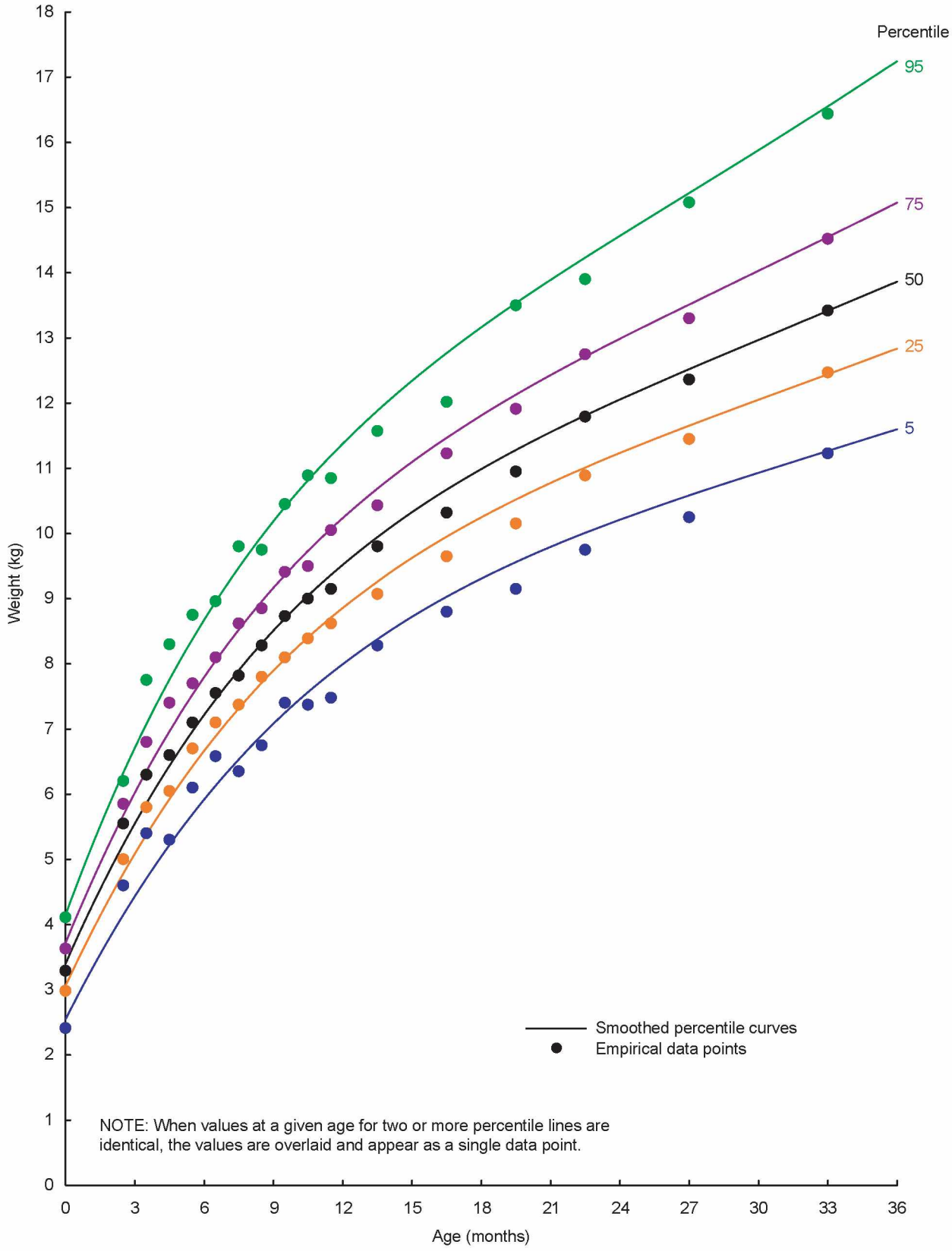


Figure 34. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Girls weight-for-age

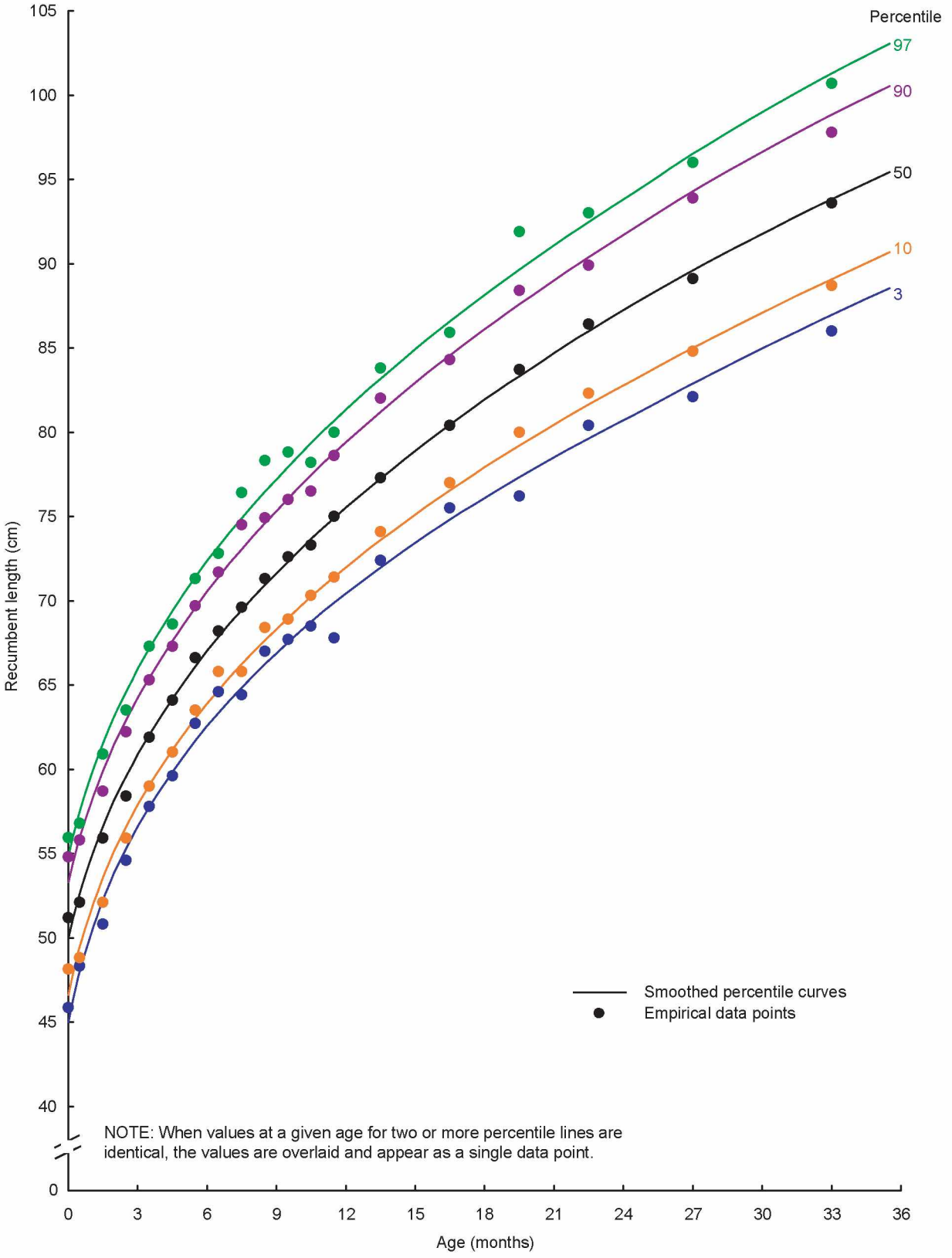


Figure 35. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Boys recumbent length-for-age

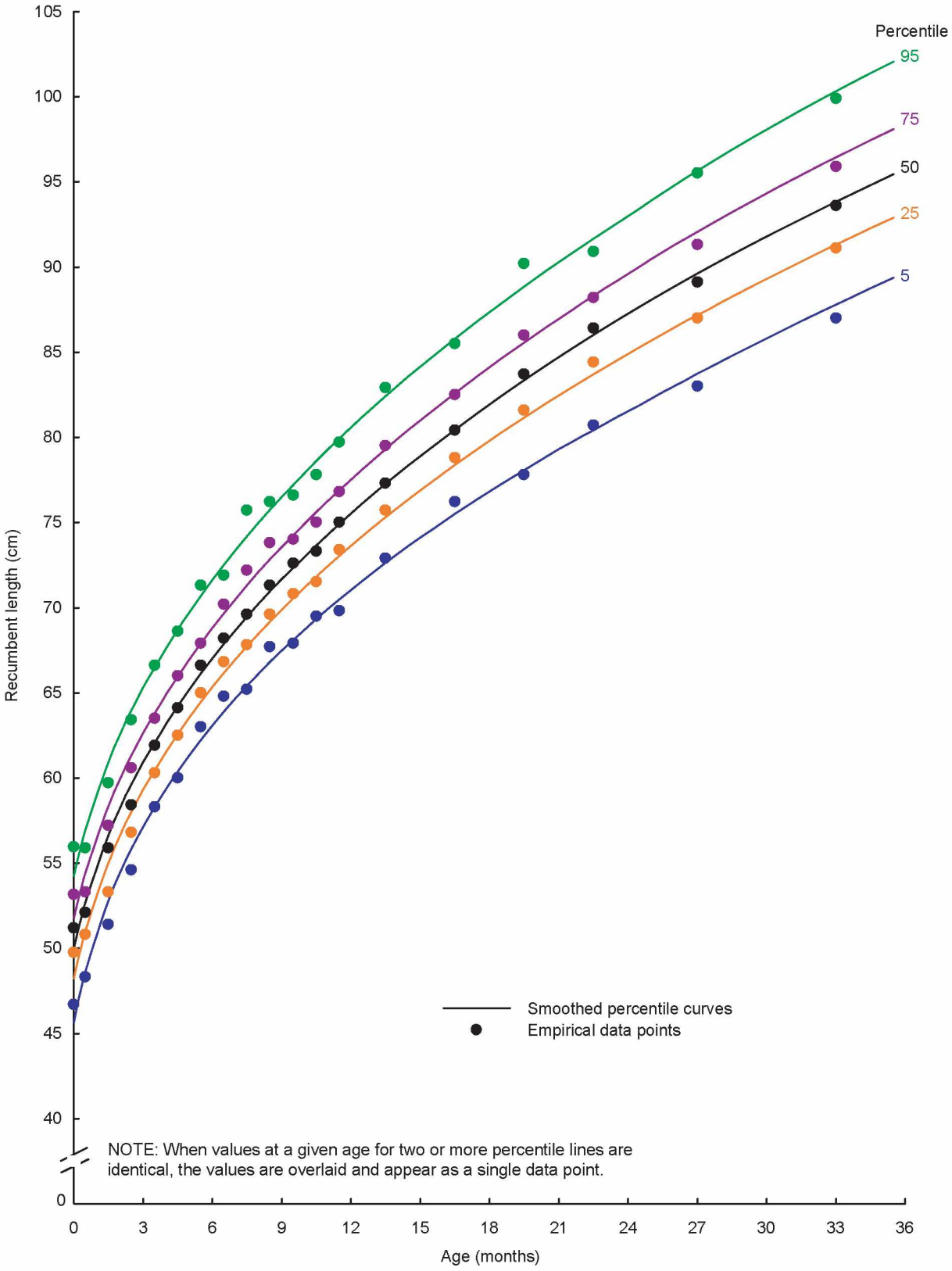


Figure 36. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Boys recumbent length-for-age

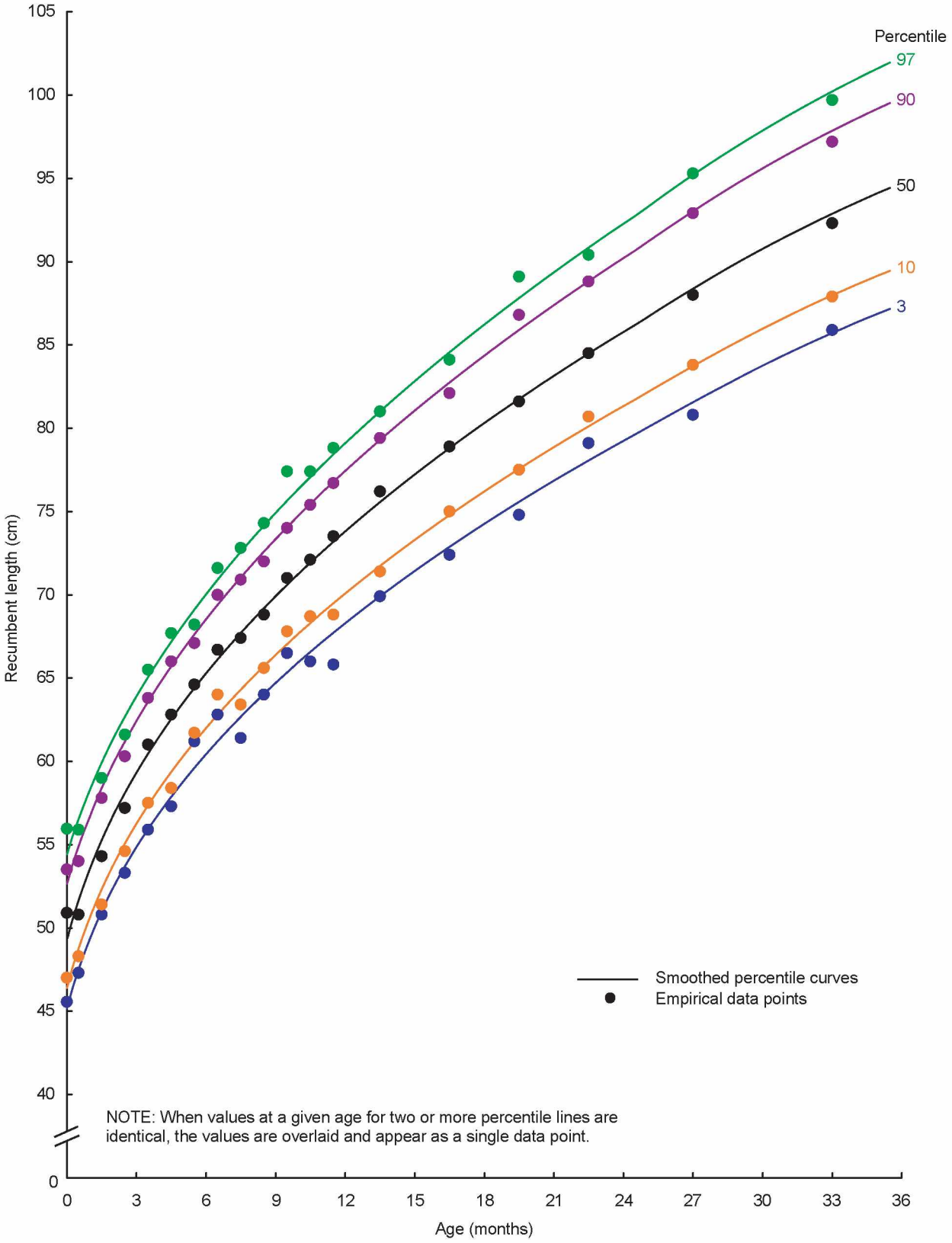


Figure 37. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Girls recumbent length-for-age

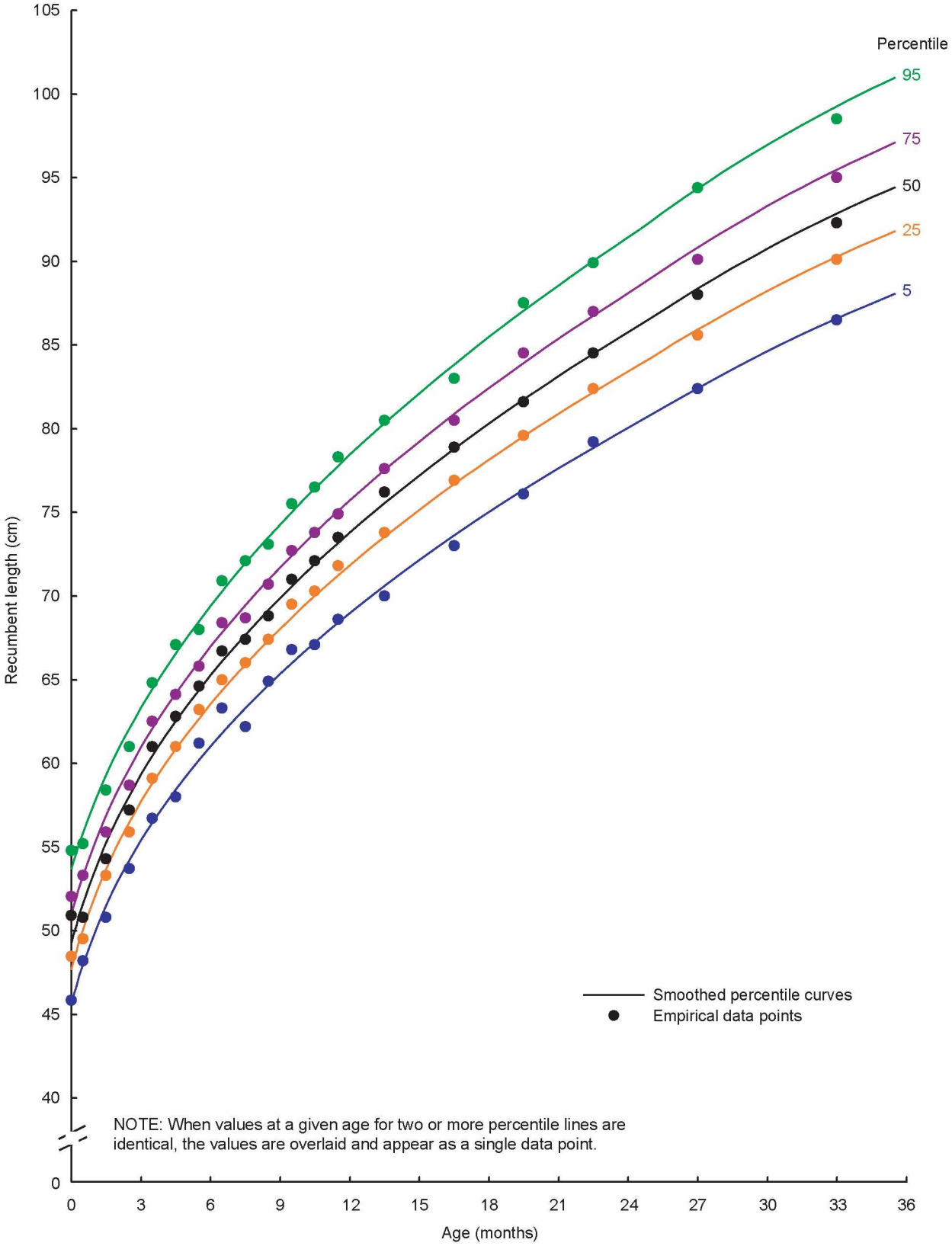


Figure 38. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Girls recumbent length-for-age

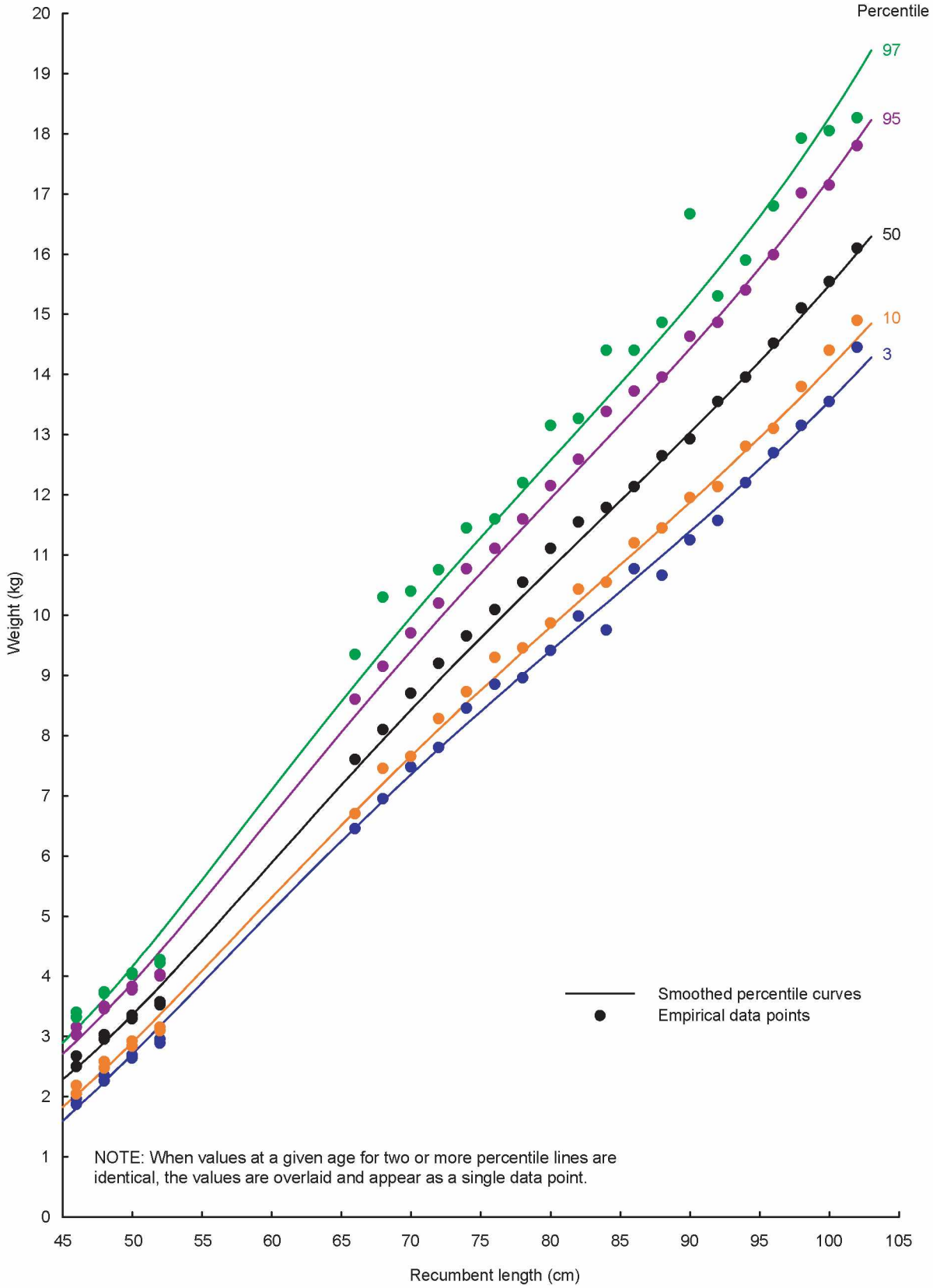


Figure 39. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 46–102 cm: Boys weight-for-length

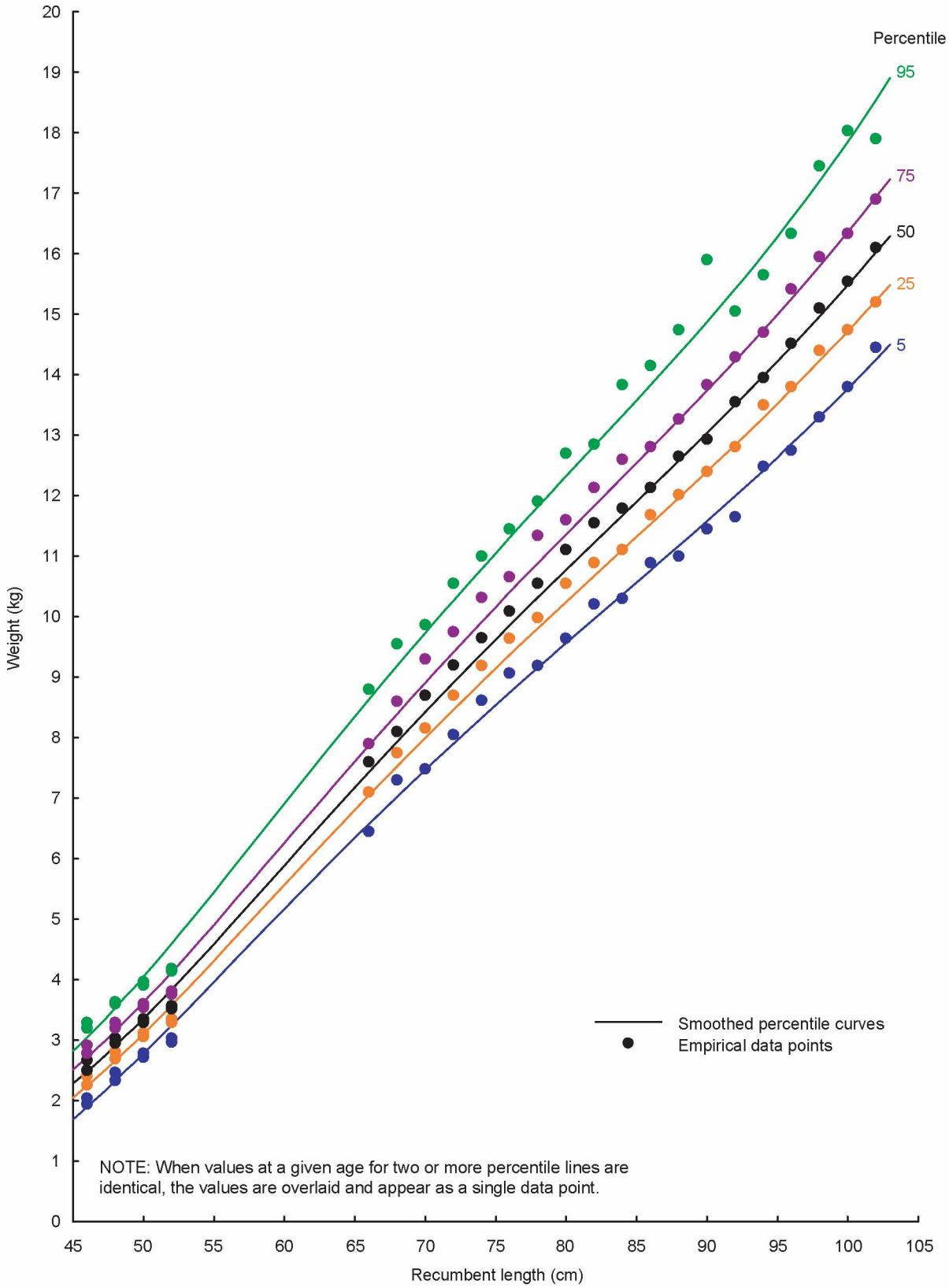


Figure 40. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 46–102 cm: Boys weight-for-length

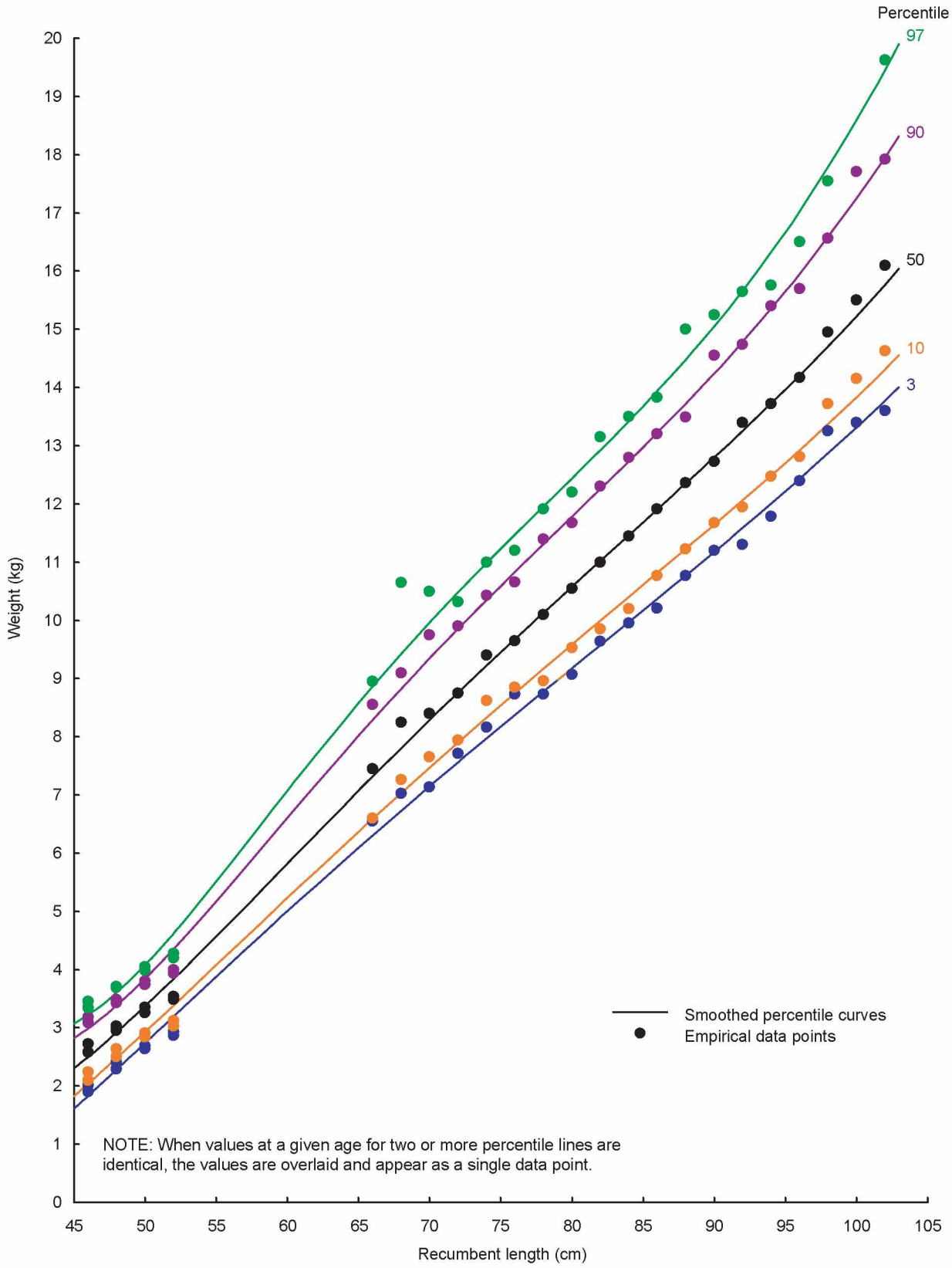


Figure 41. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 46–102 cm: Girls weight-for-length

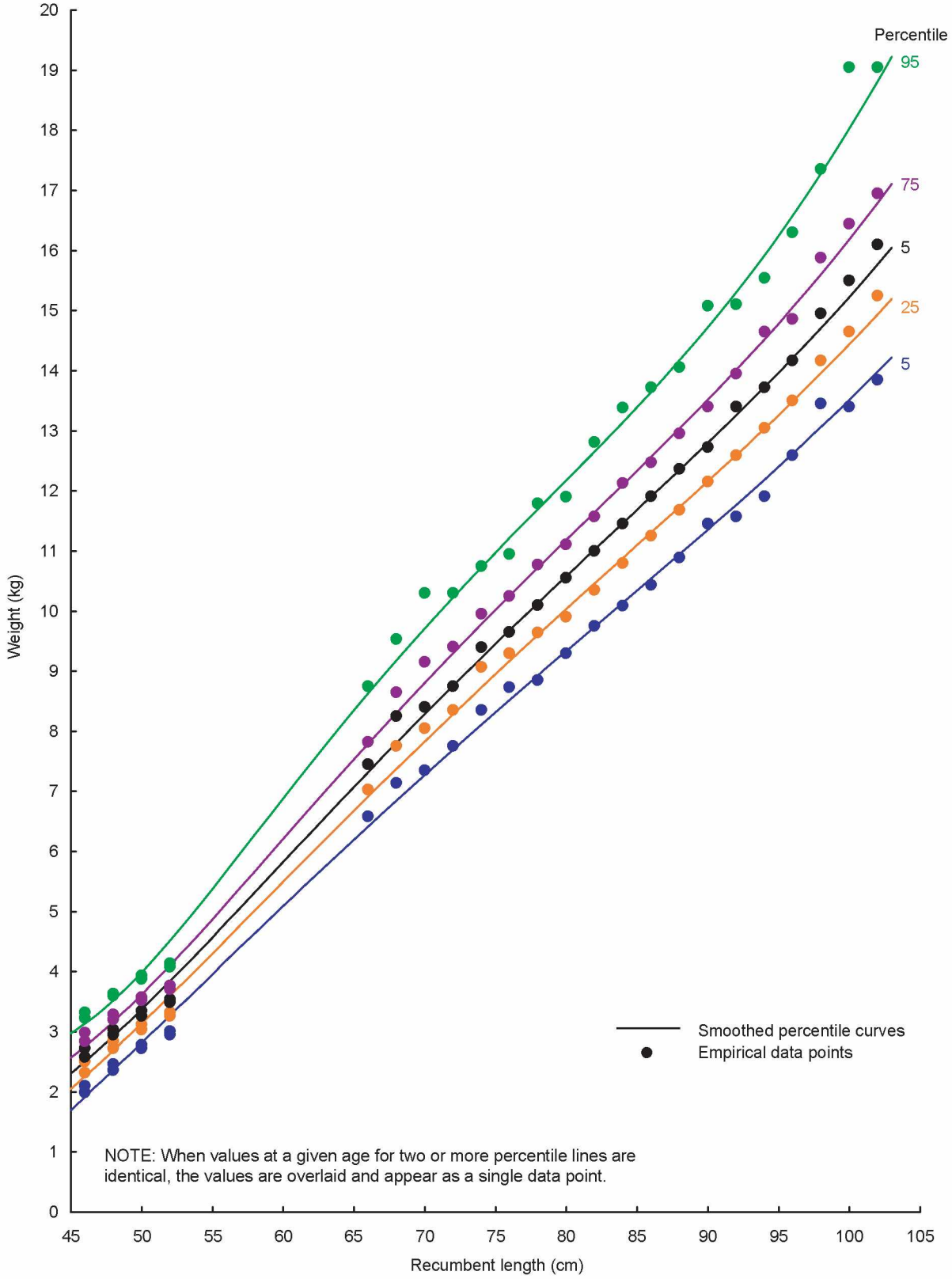


Figure 42. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 46–102 cm: Girls weight-for-length

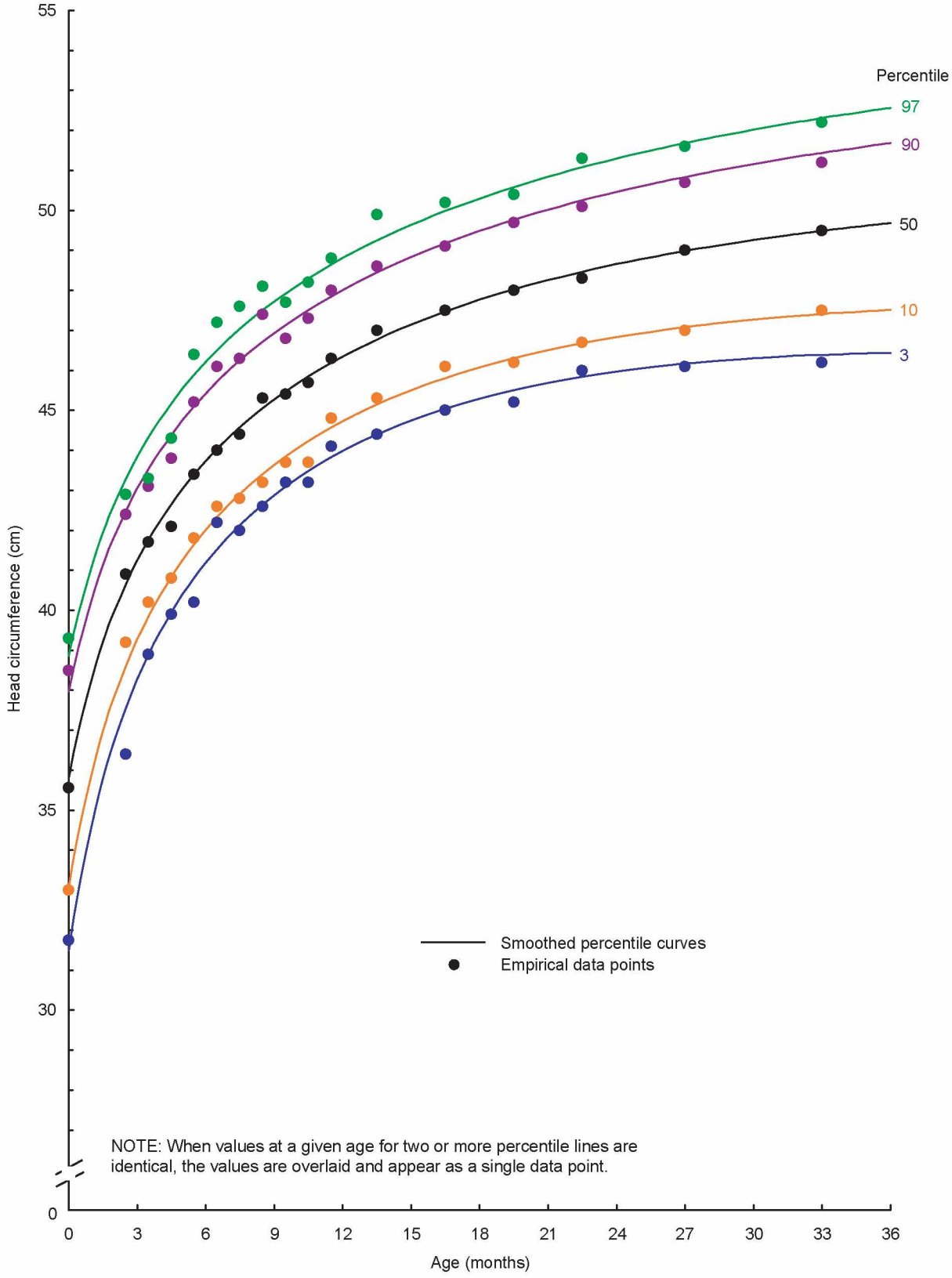


Figure 43. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Boys head circumference-for-age

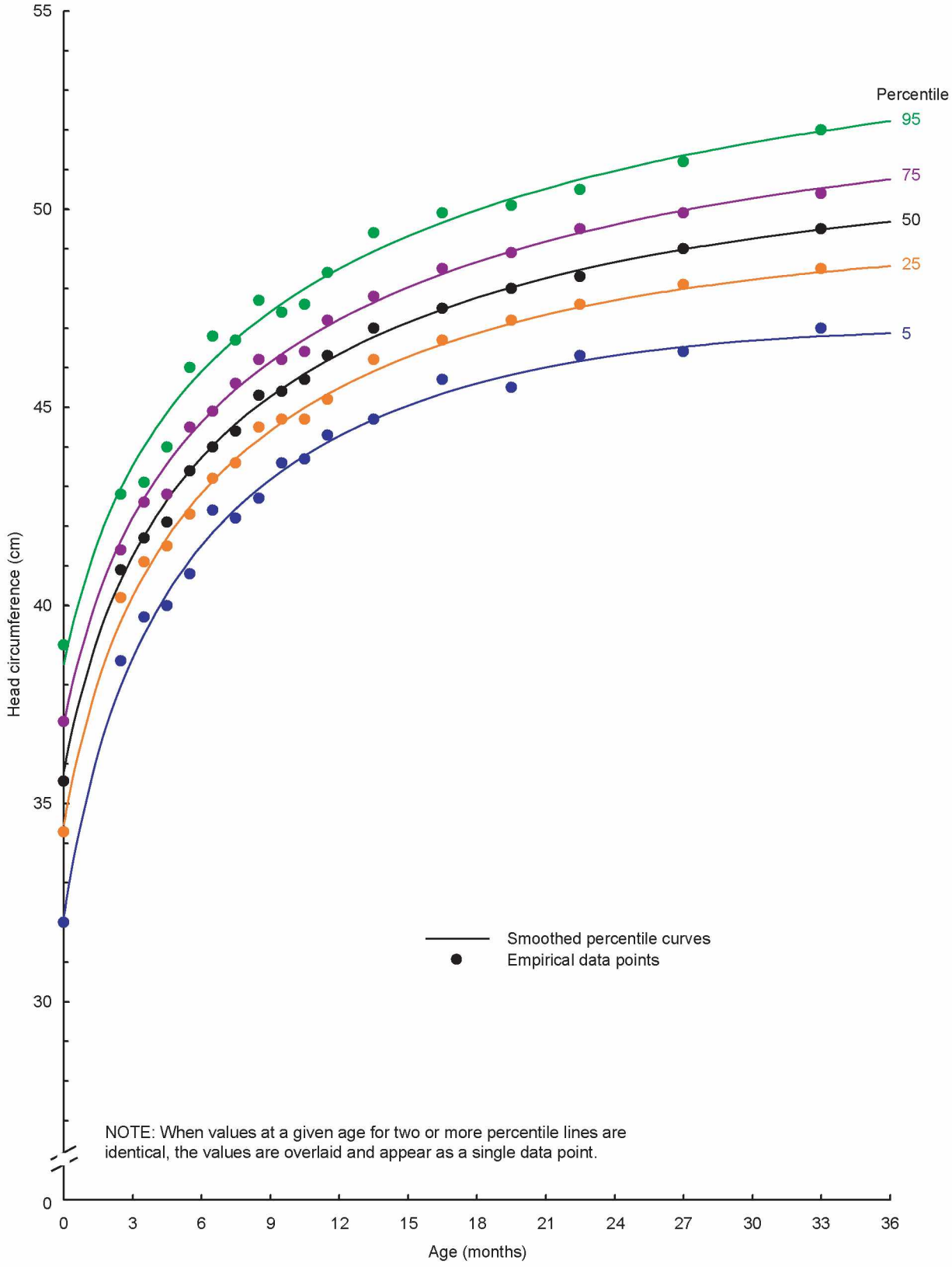


Figure 44. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Boys head circumference-for-age

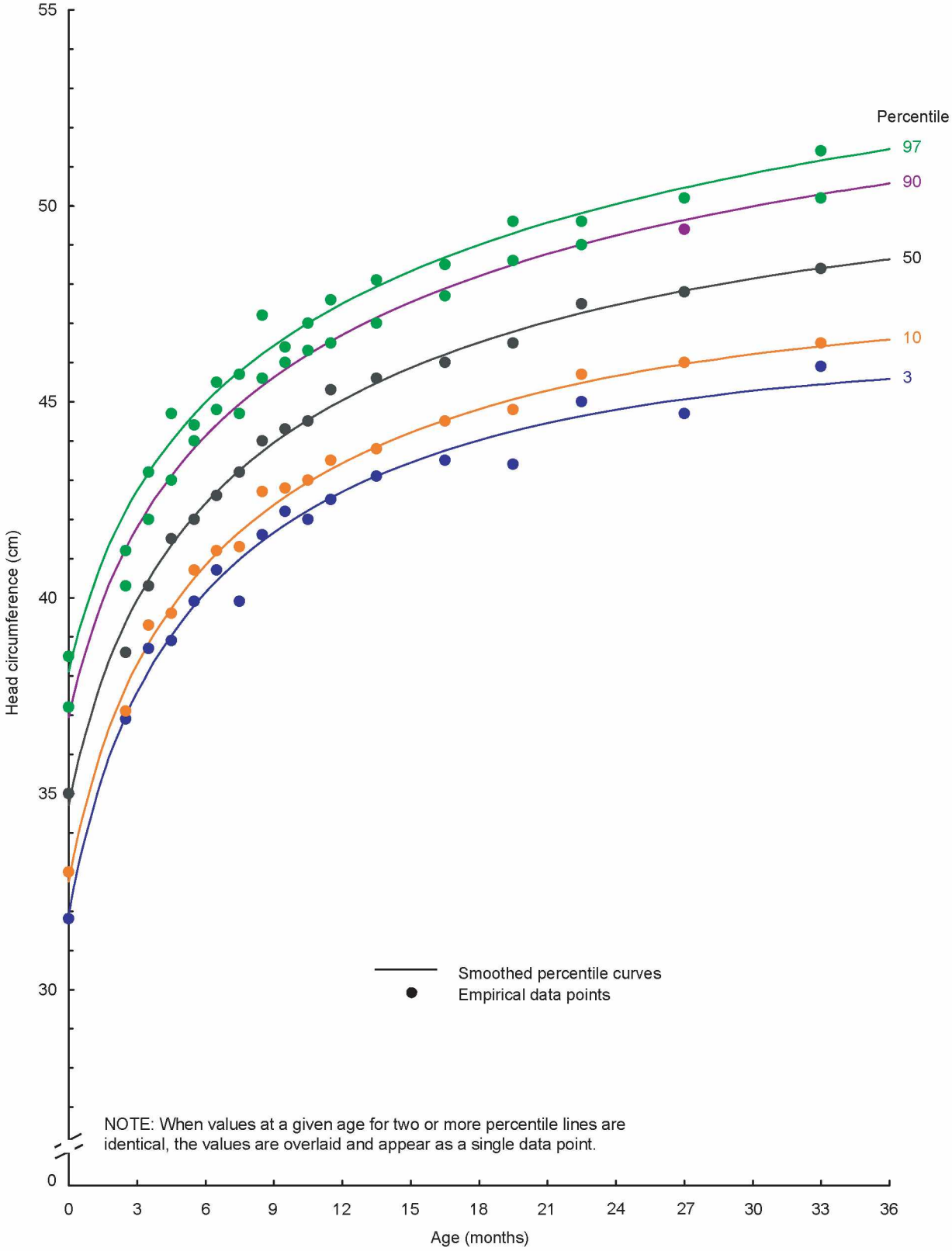


Figure 45. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, birth to 36 months: Girls head circumference-for-age

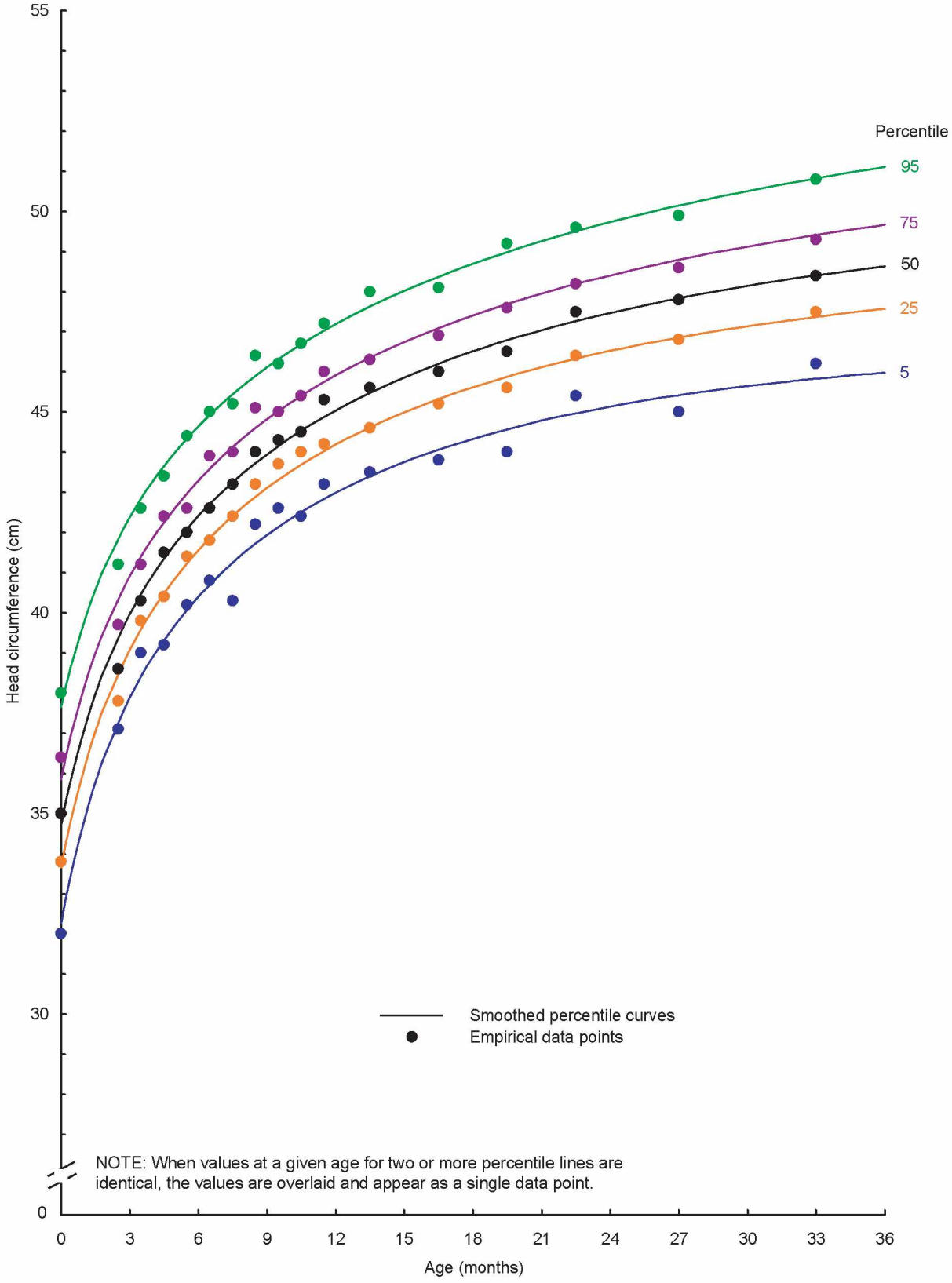


Figure 46. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, birth to 36 months: Girls head circumference-for-age

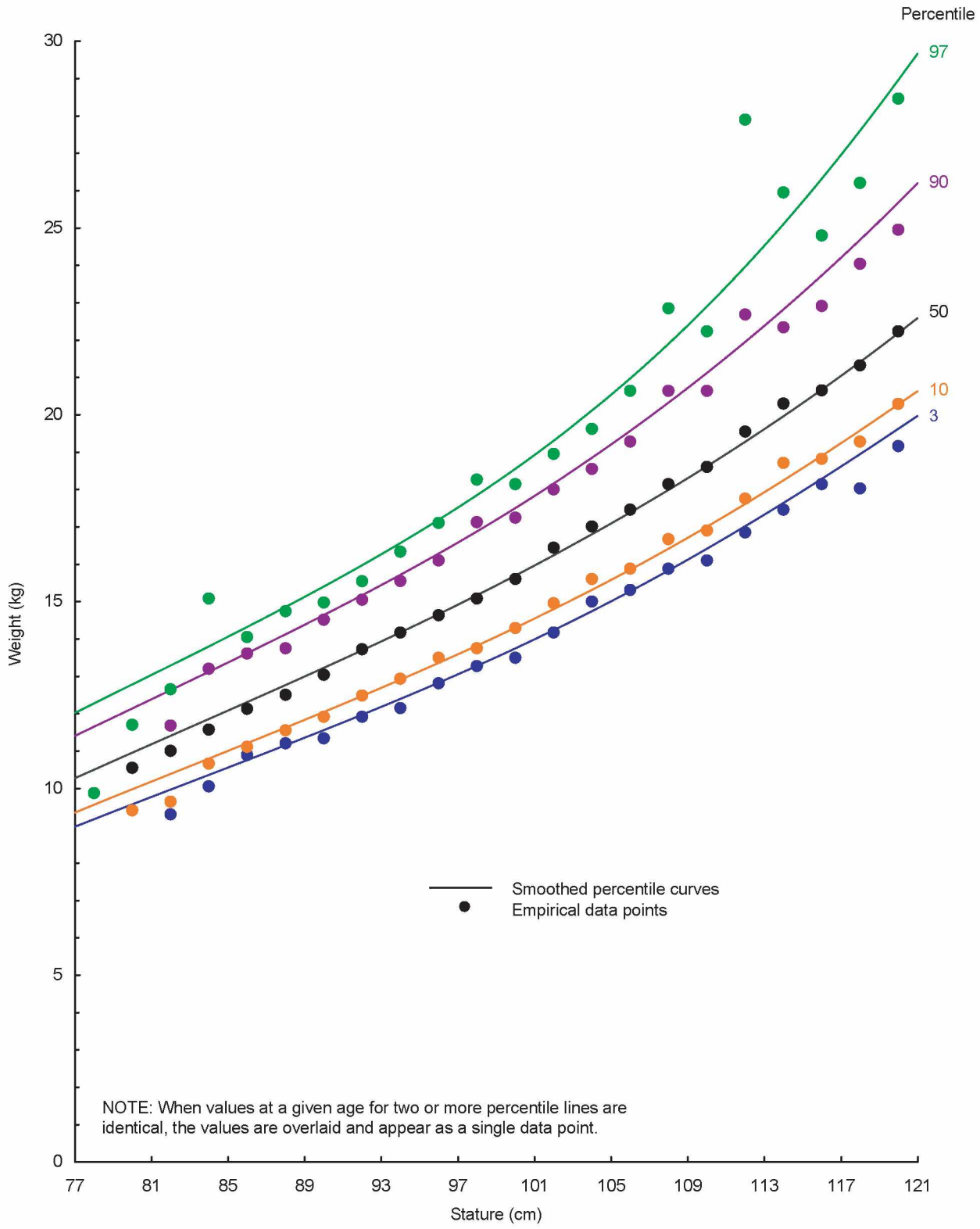


Figure 47. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 78–120 cm: Boys weight-for-stature

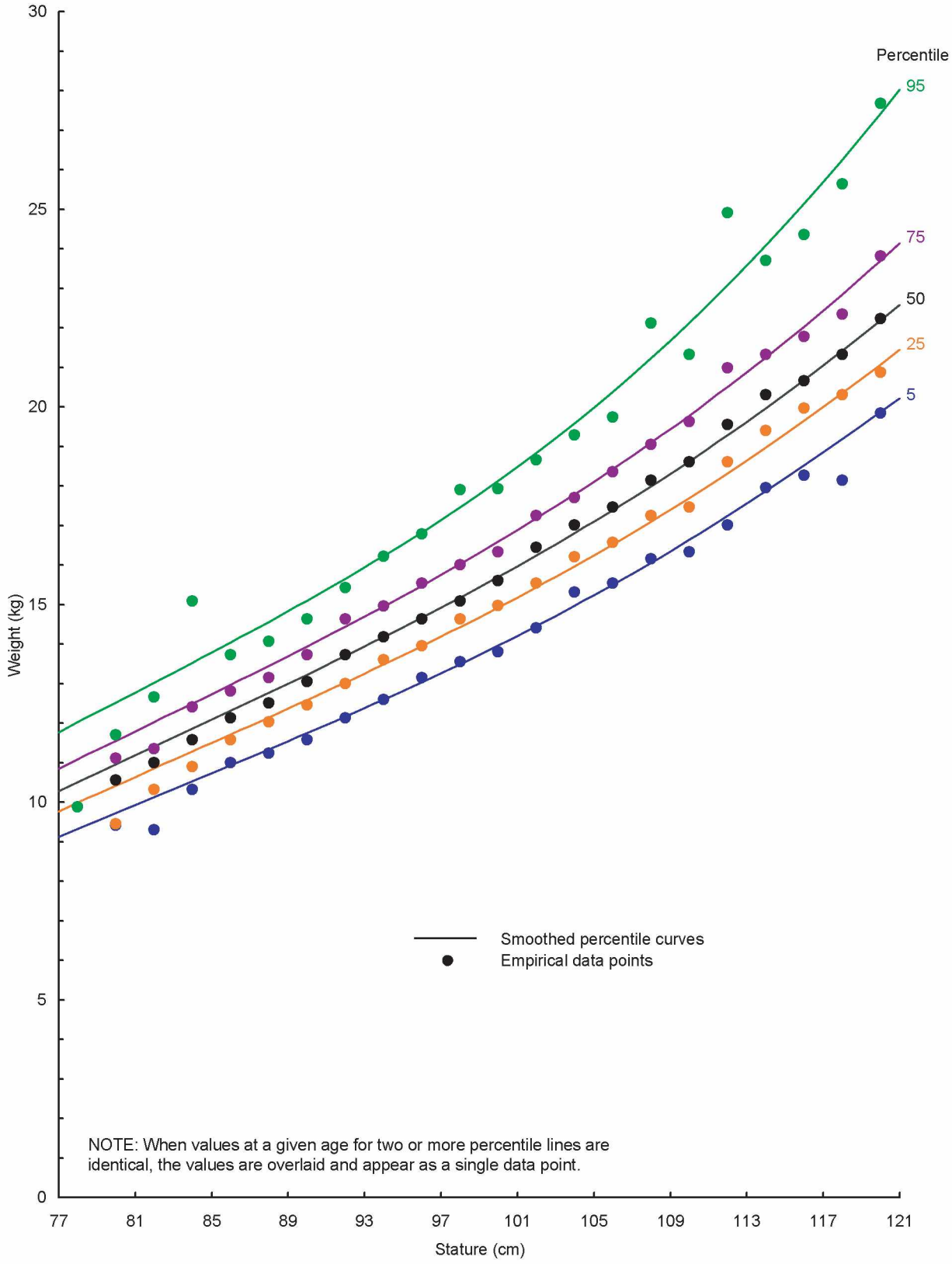


Figure 48. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 78–120 cm: Boys weight-for-stature

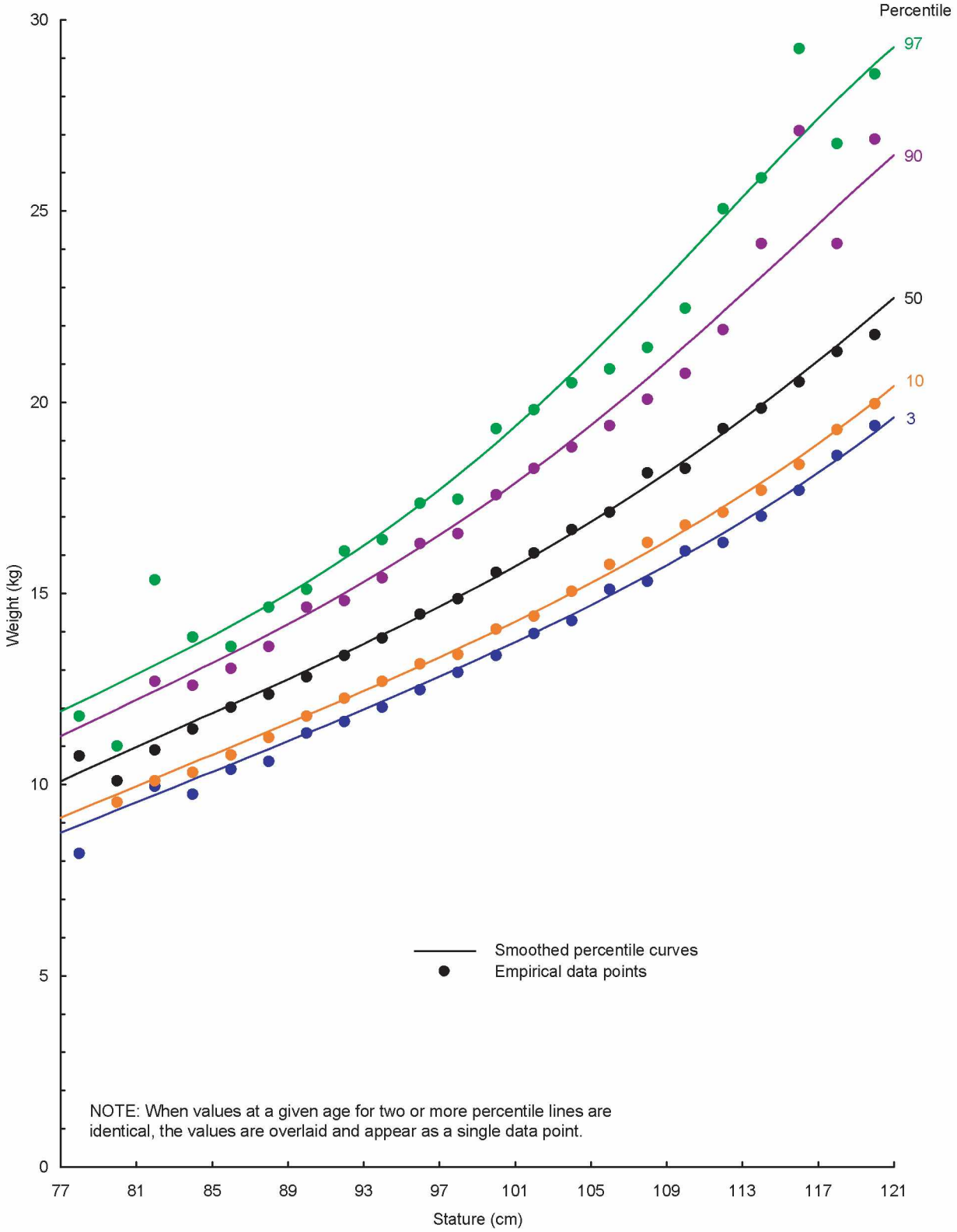


Figure 49. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 78–120 cm: Girls weight-for-stature

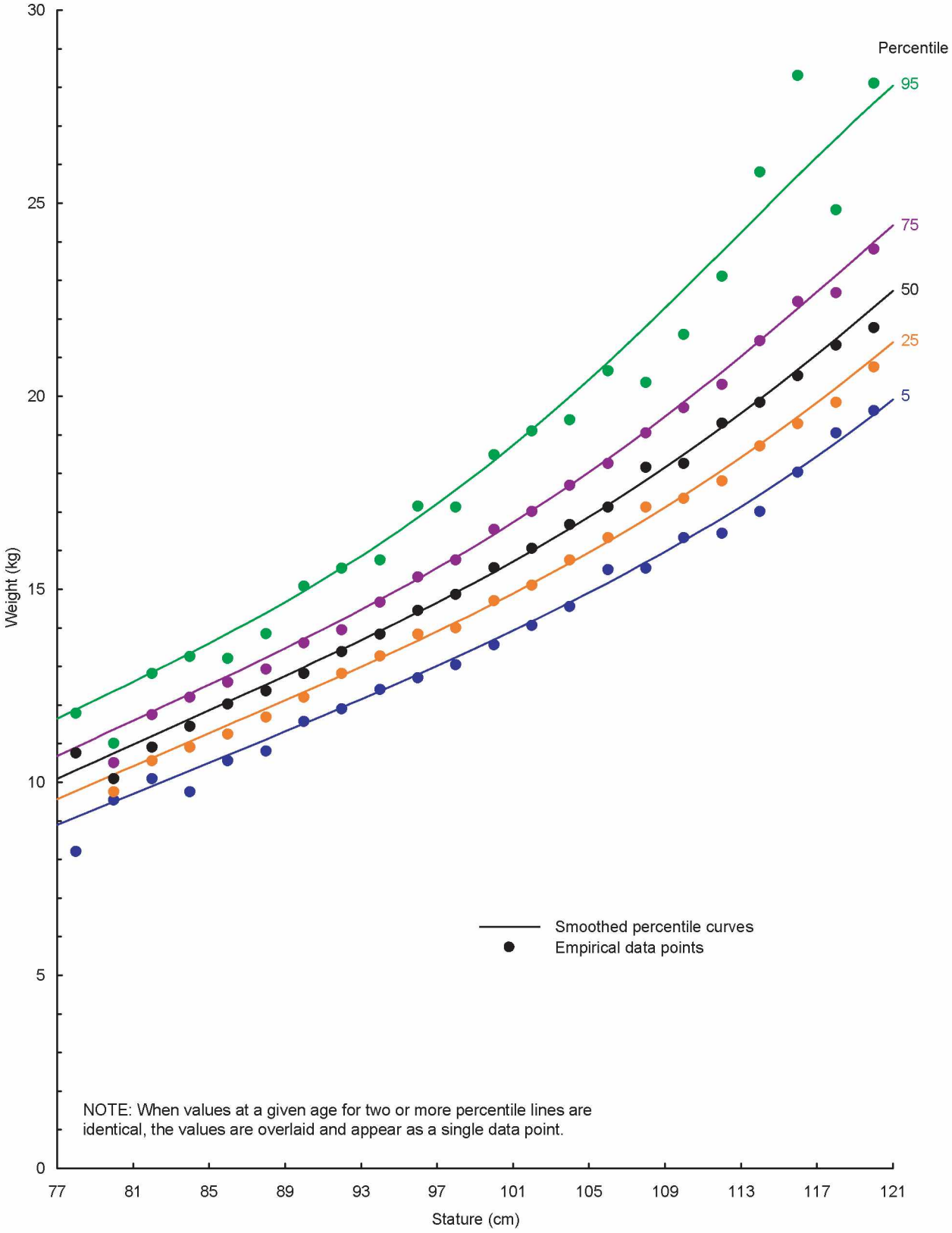


Figure 50. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 78–120 cm: Girls weight-for-stature

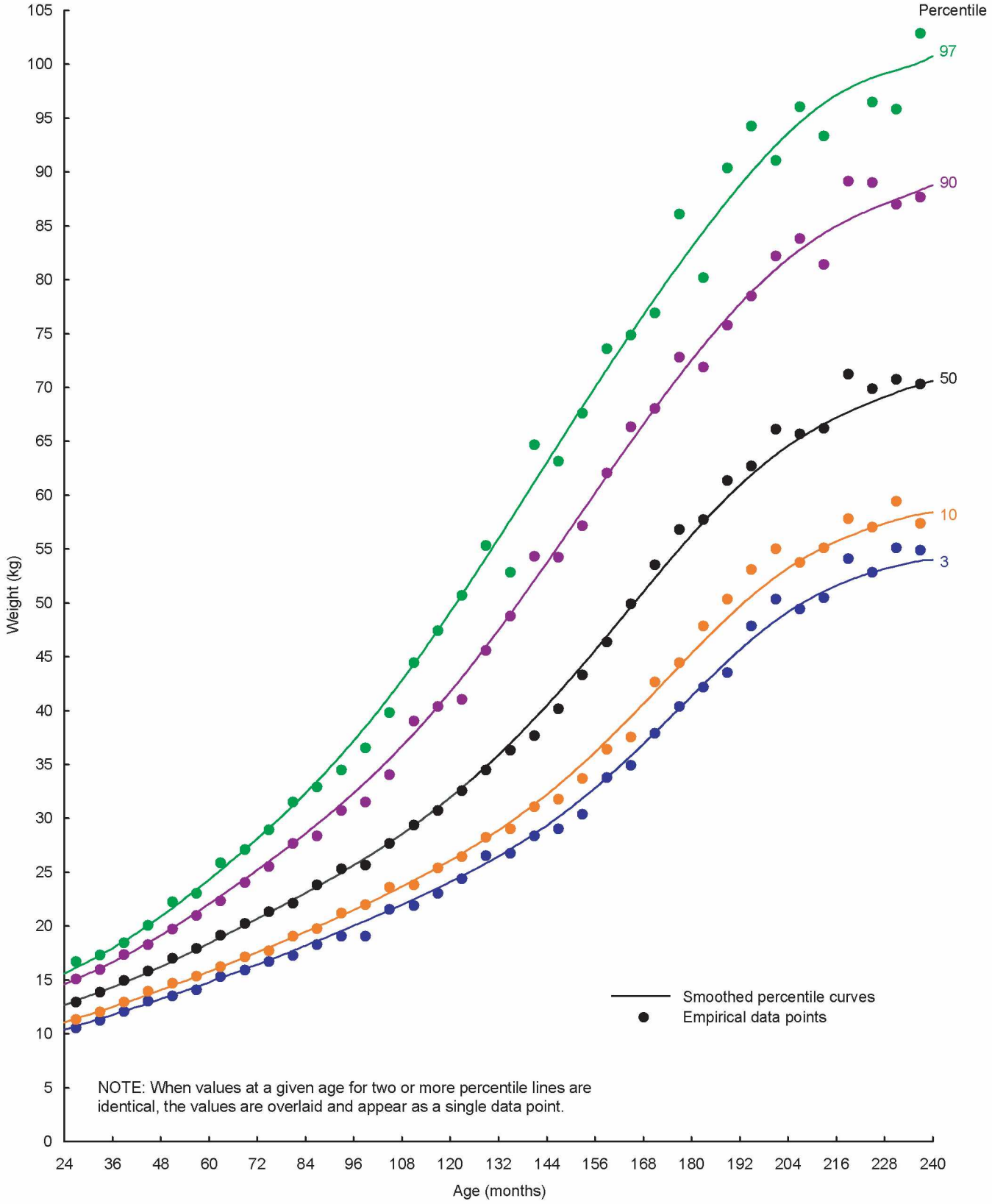


Figure 51. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Boys weight-for-age

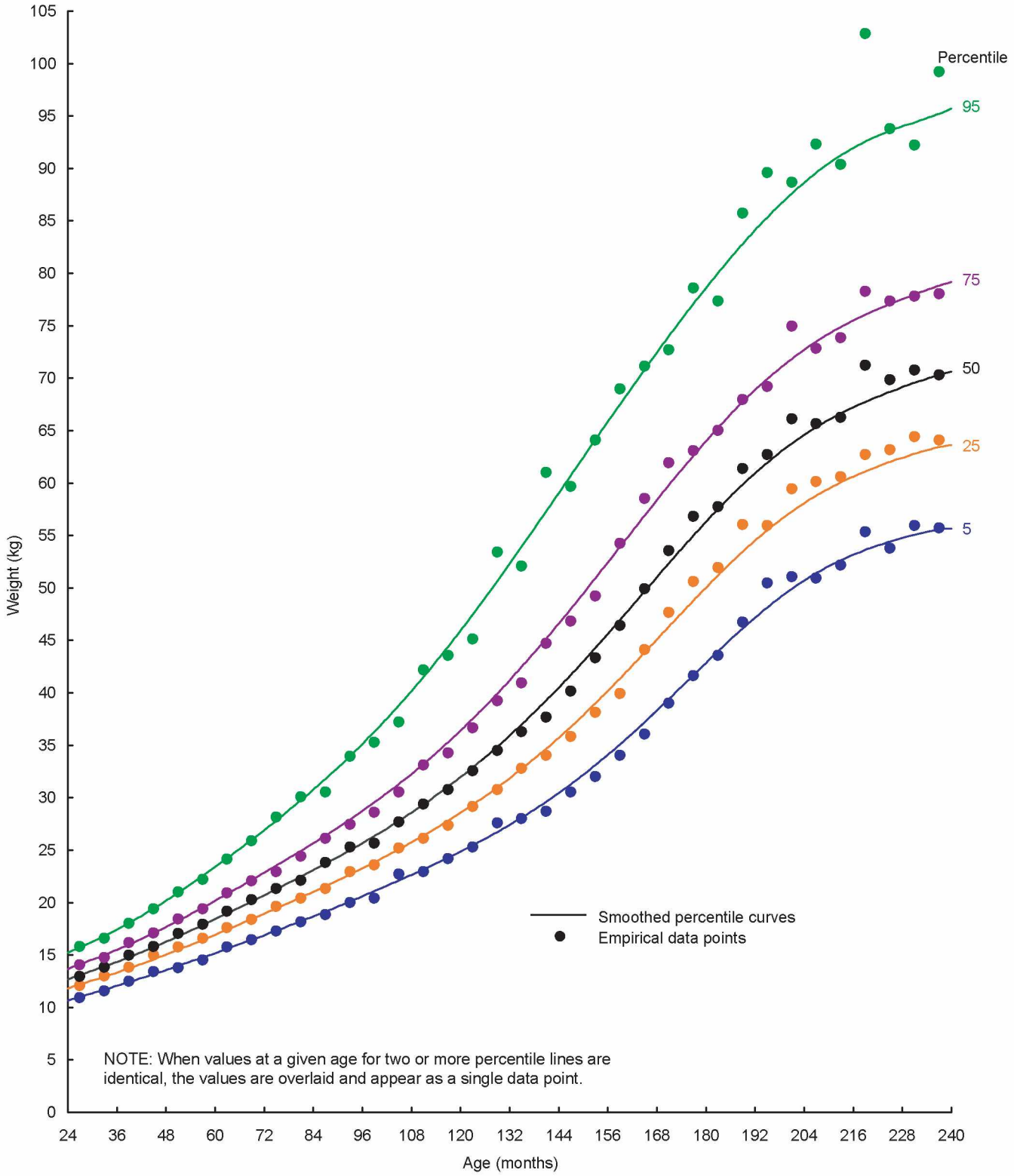


Figure 52. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 24–237 months: Boys weight-for-age

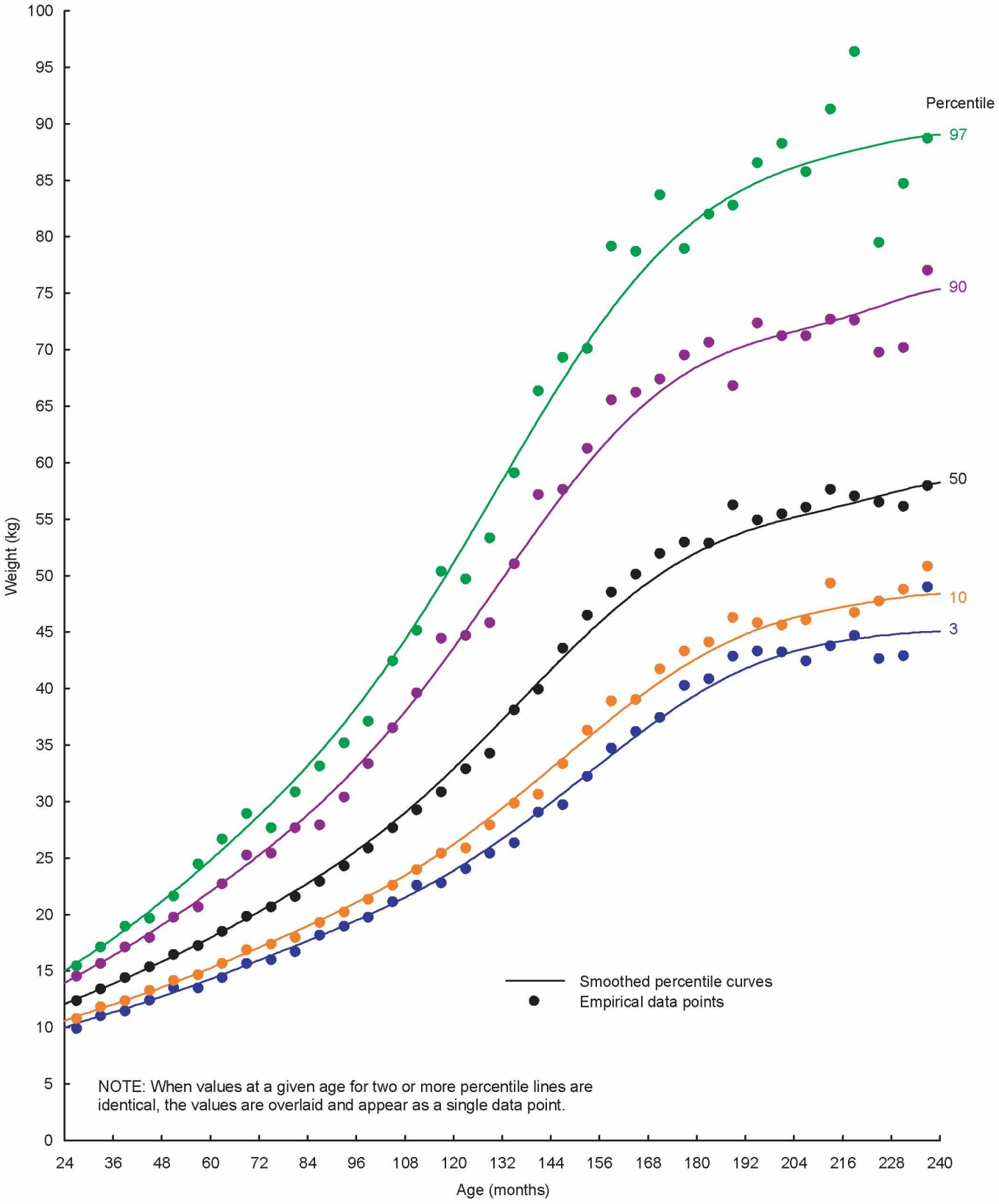


Figure 53. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Girls weight-for-age

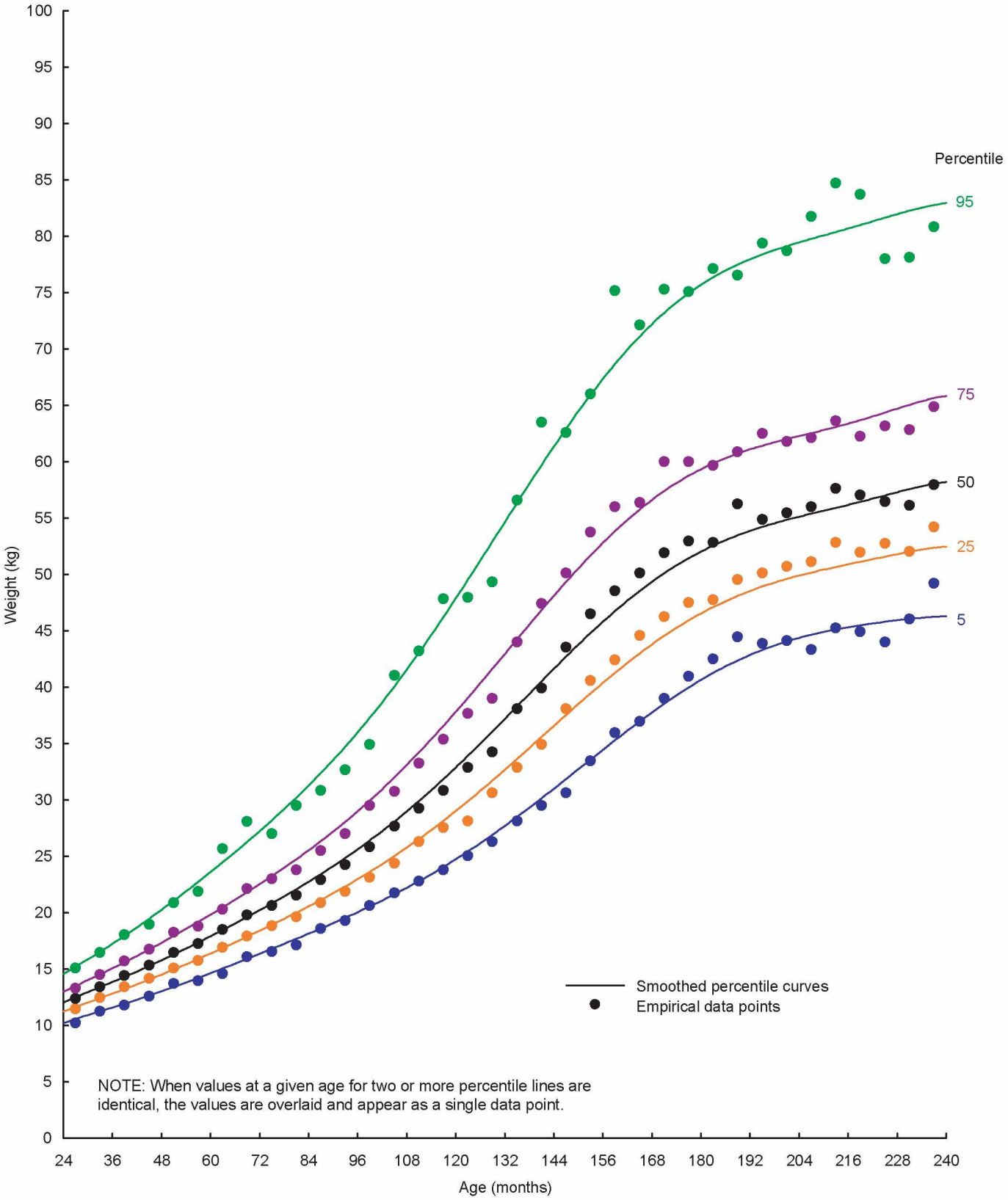


Figure 54. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 24–237 months: Girls weight-for-age

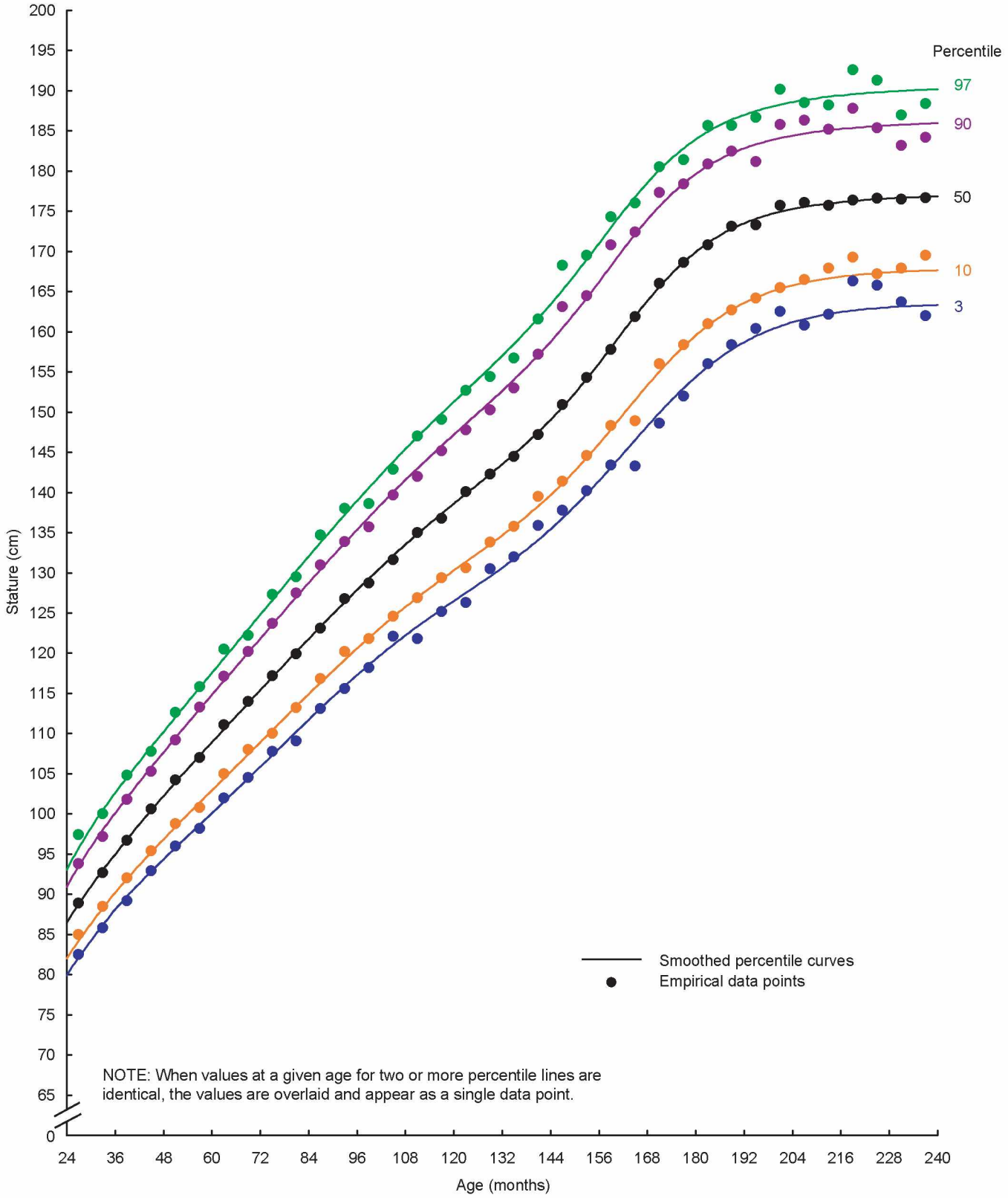


Figure 55. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Boys stature-for-age

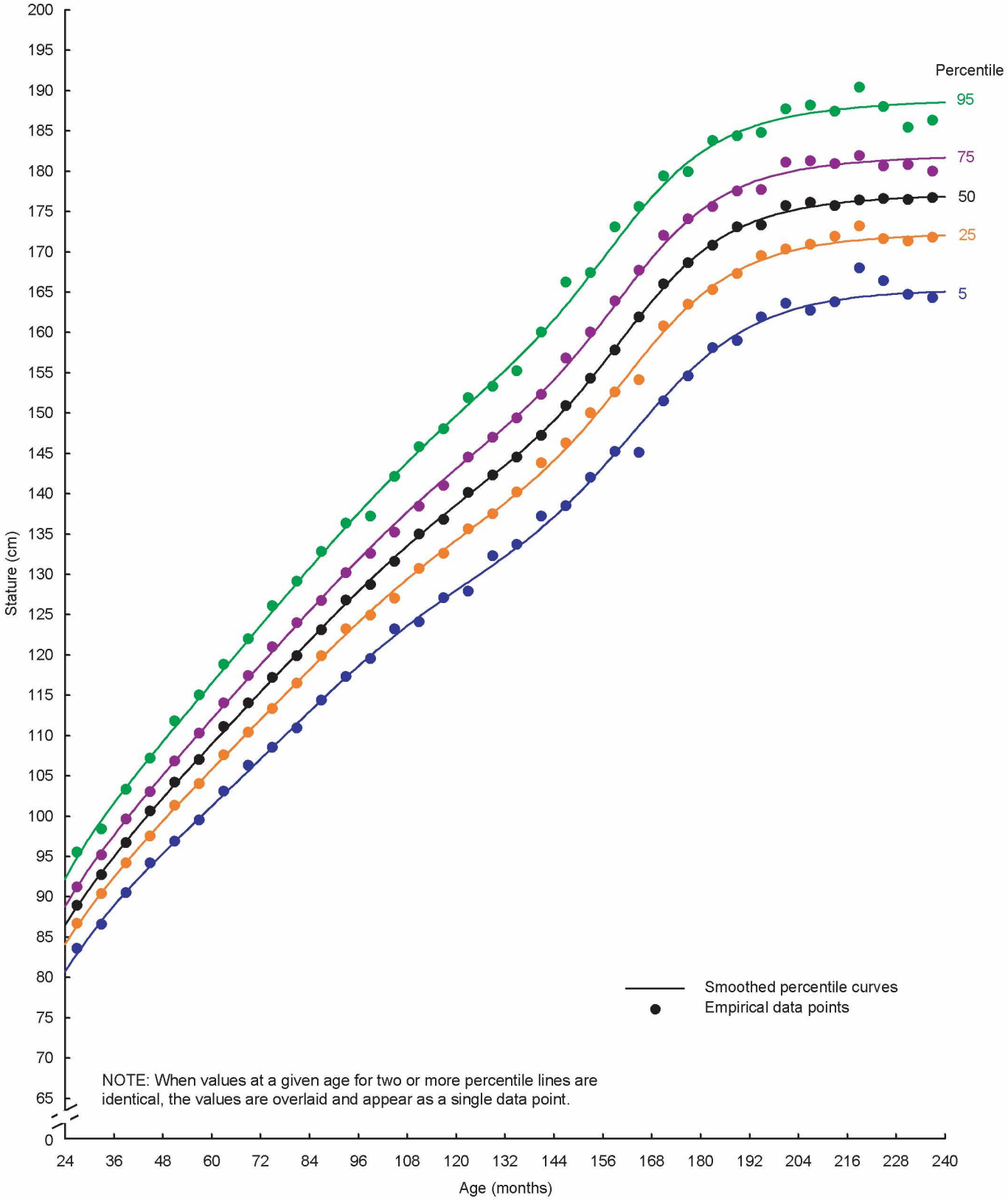


Figure 56. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 24–237 months: Boys stature-for-age

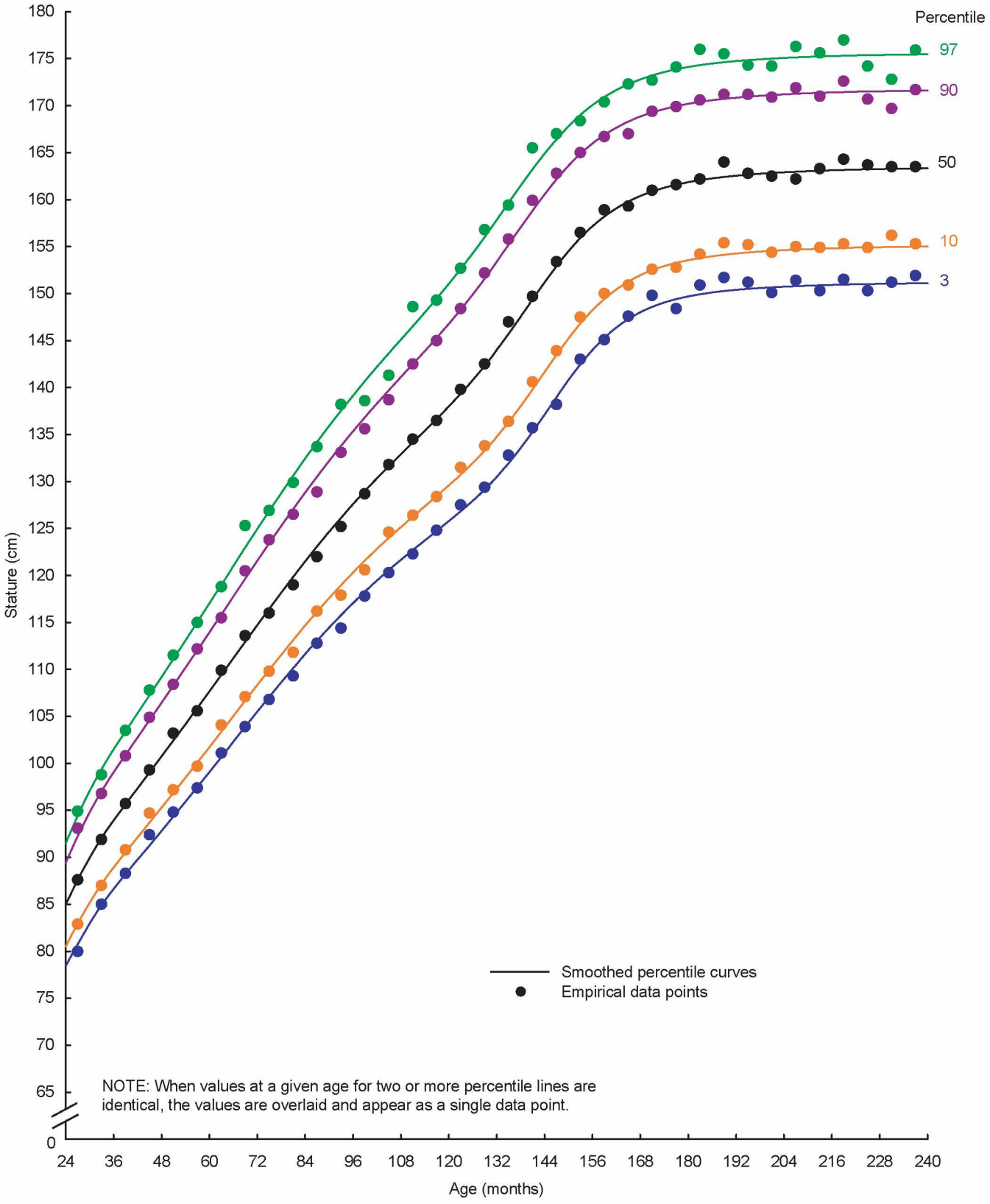


Figure 57. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Girls stature-for-age

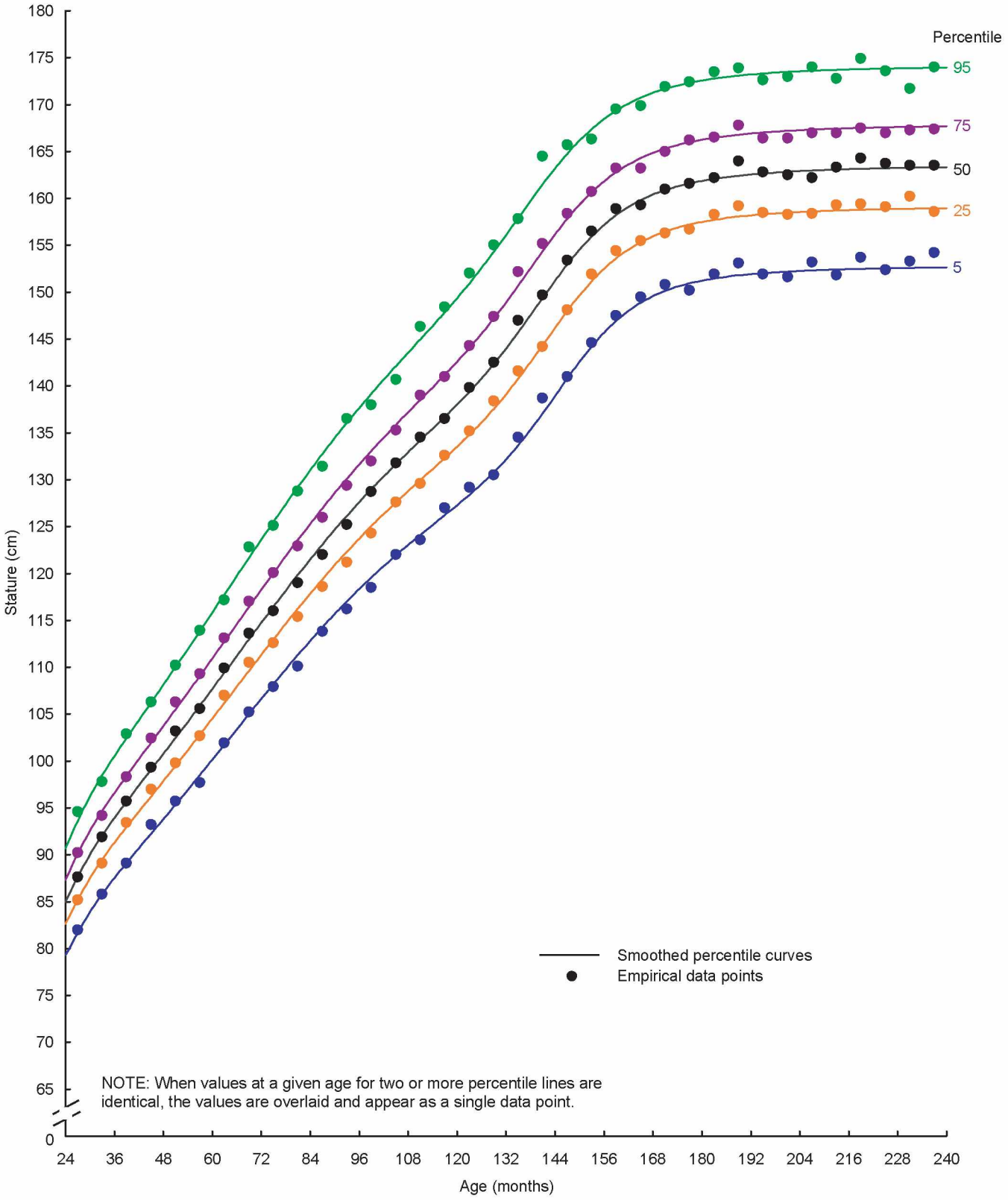


Figure 58. Comparison of smoothed 5th, 25th, 50th, 75th, 95th percentile curves to empirical data points, 24–237 months: Girls stature-for-age

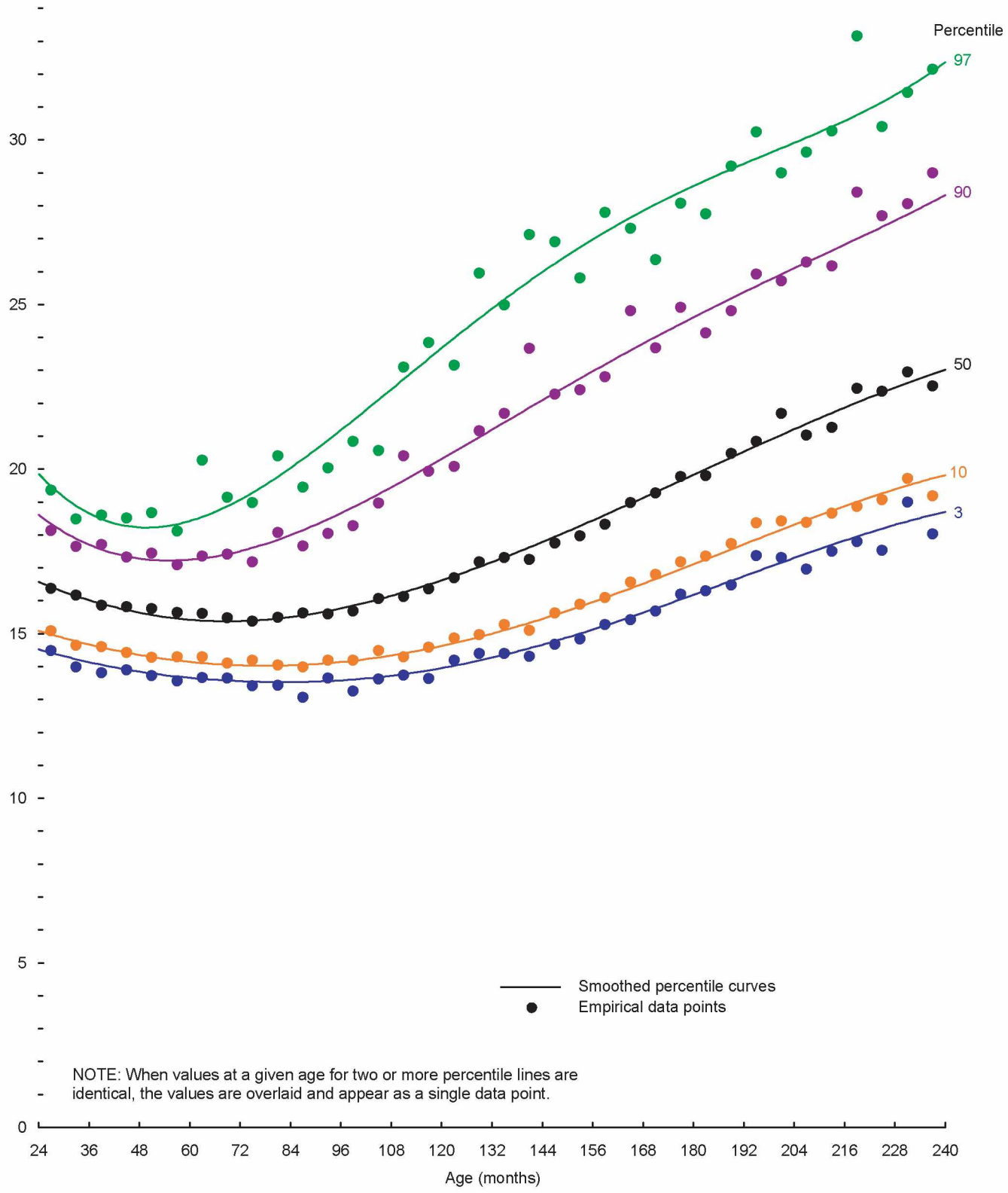


Figure 59. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Boys body mass index-for-age

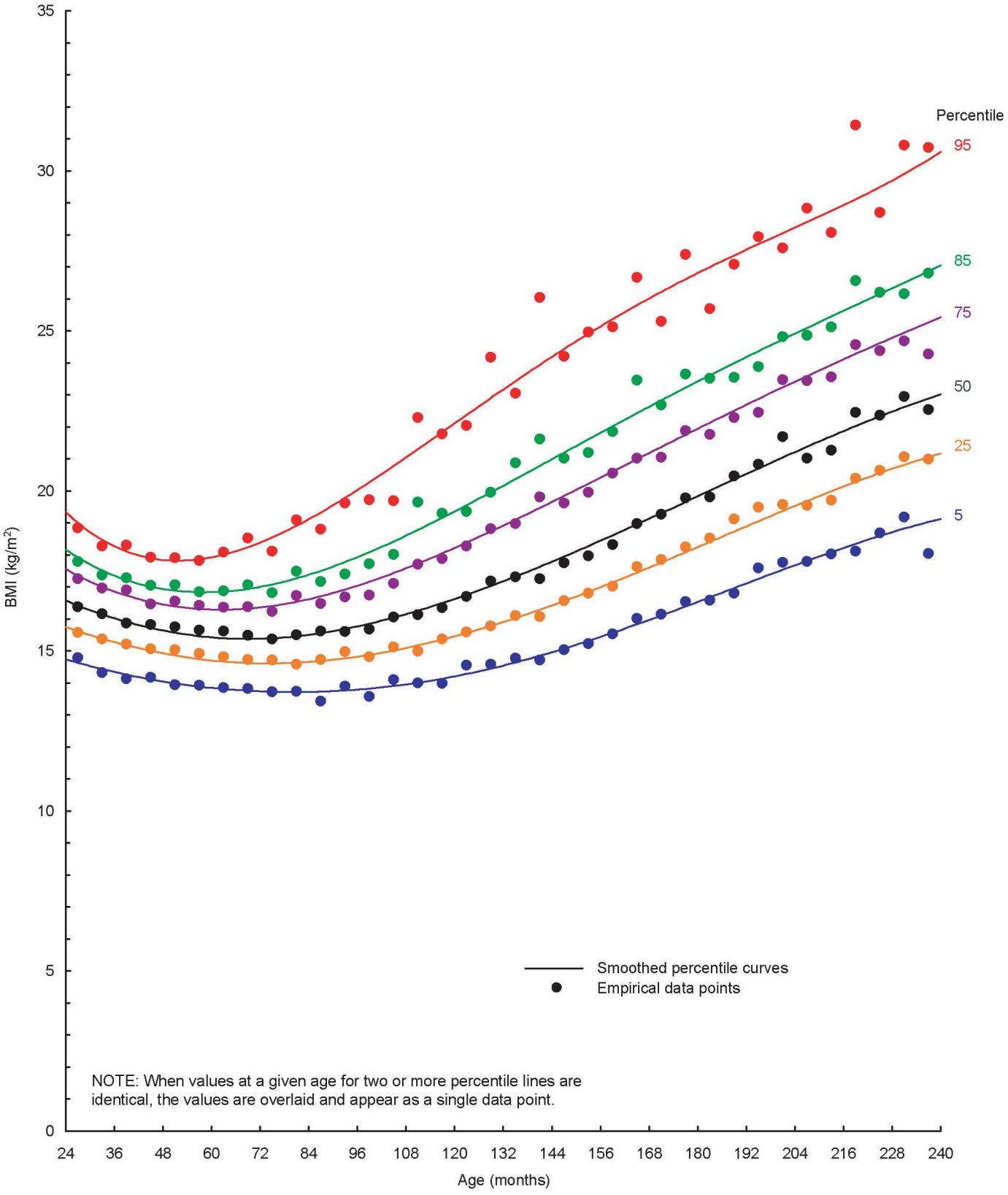


Figure 60. Comparison of smoothed 5th, 25th, 50th, 75th, 85th, 95th percentile curves to empirical data points, 24–237 months: Boys body mass index-for-age

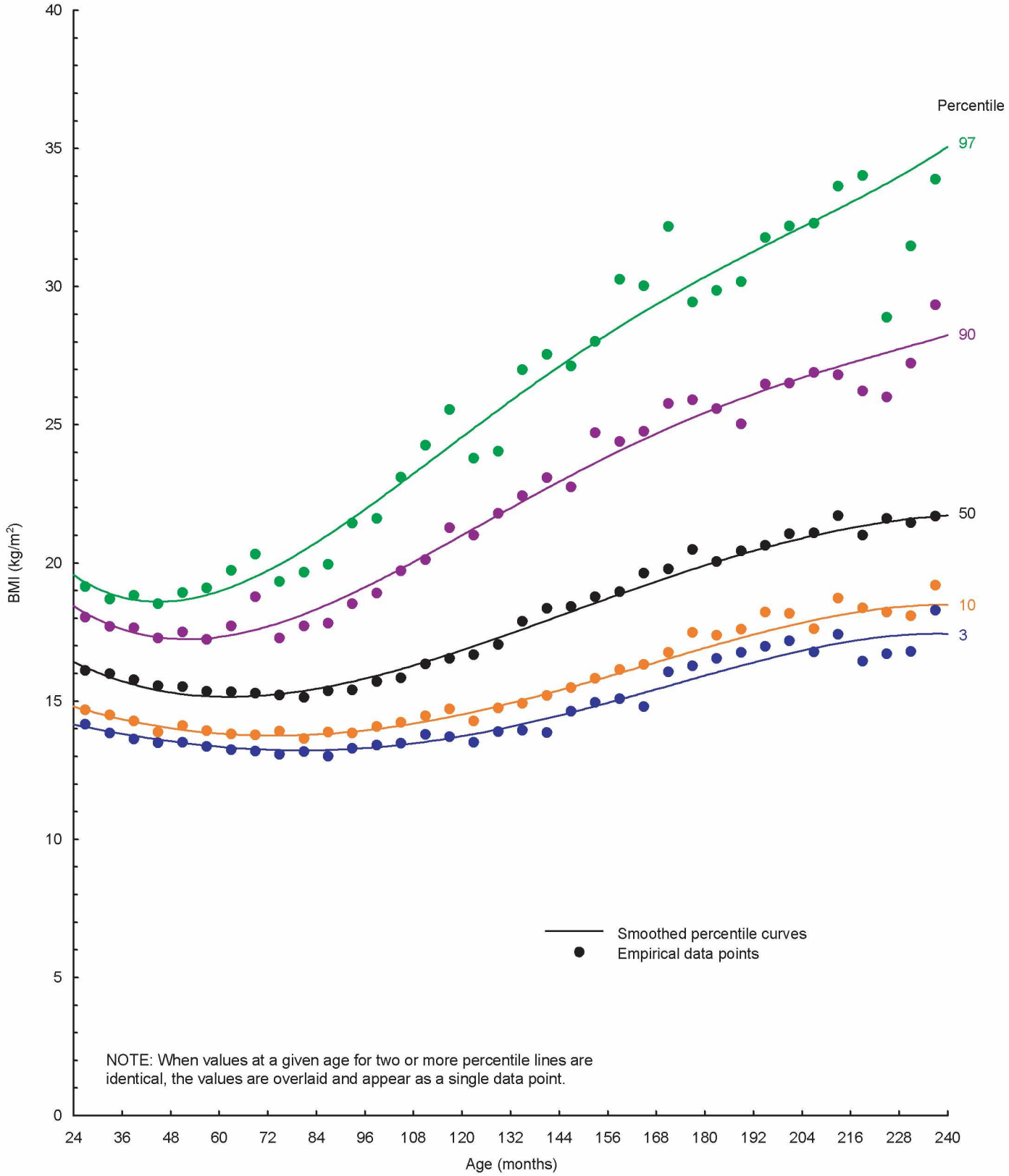


Figure 61. Comparison of smoothed 3rd, 10th, 50th, 90th, 97th percentile curves to empirical data points, 24–237 months: Girls body mass index-for-age

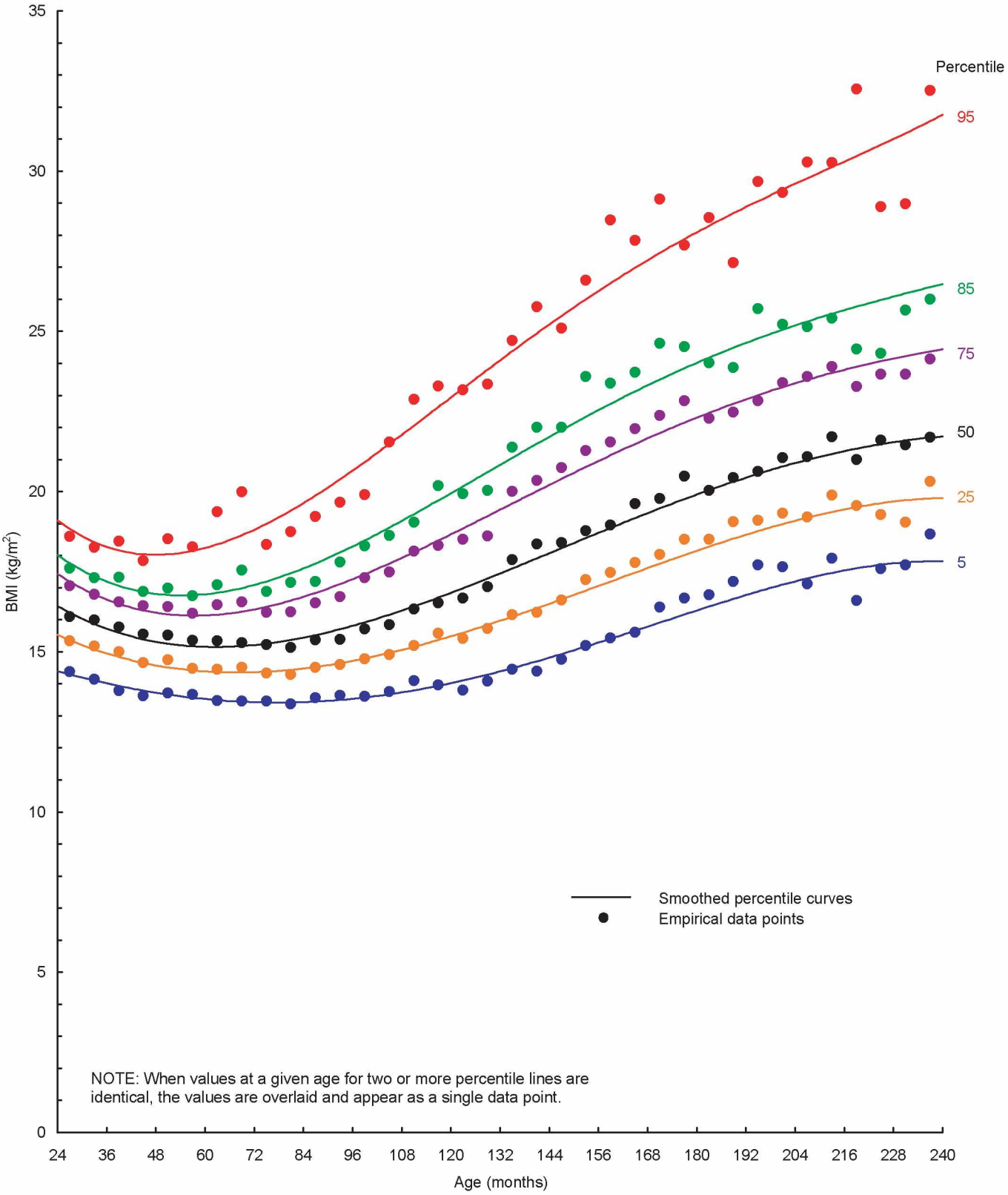


Figure 62. Comparison of smoothed 5th, 25th, 50th, 75th, 85th, 95th percentile curves to empirical data points, 24–237 months: Girls body mass index-for-age

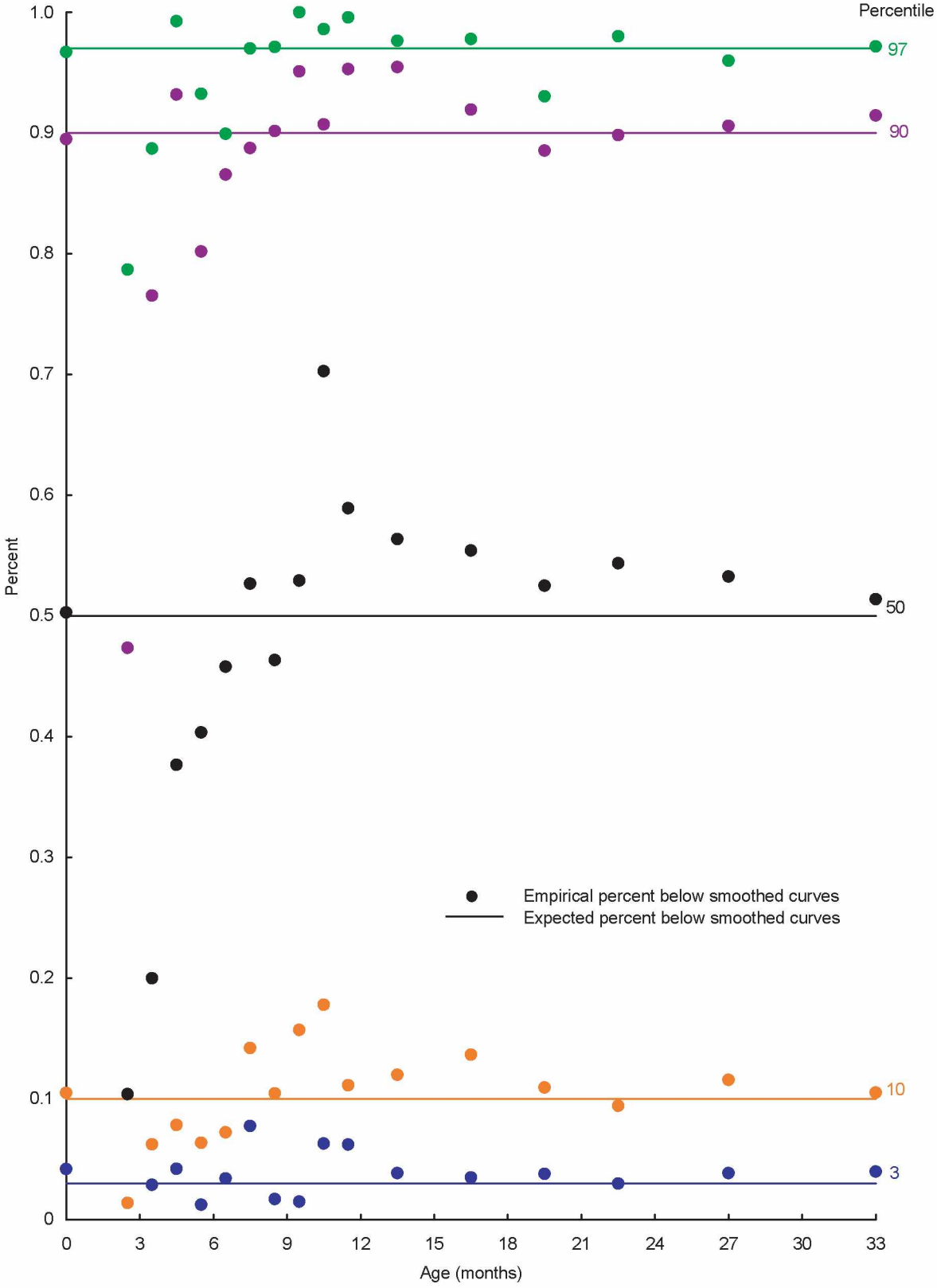


Figure 63. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Boys weight-for-age

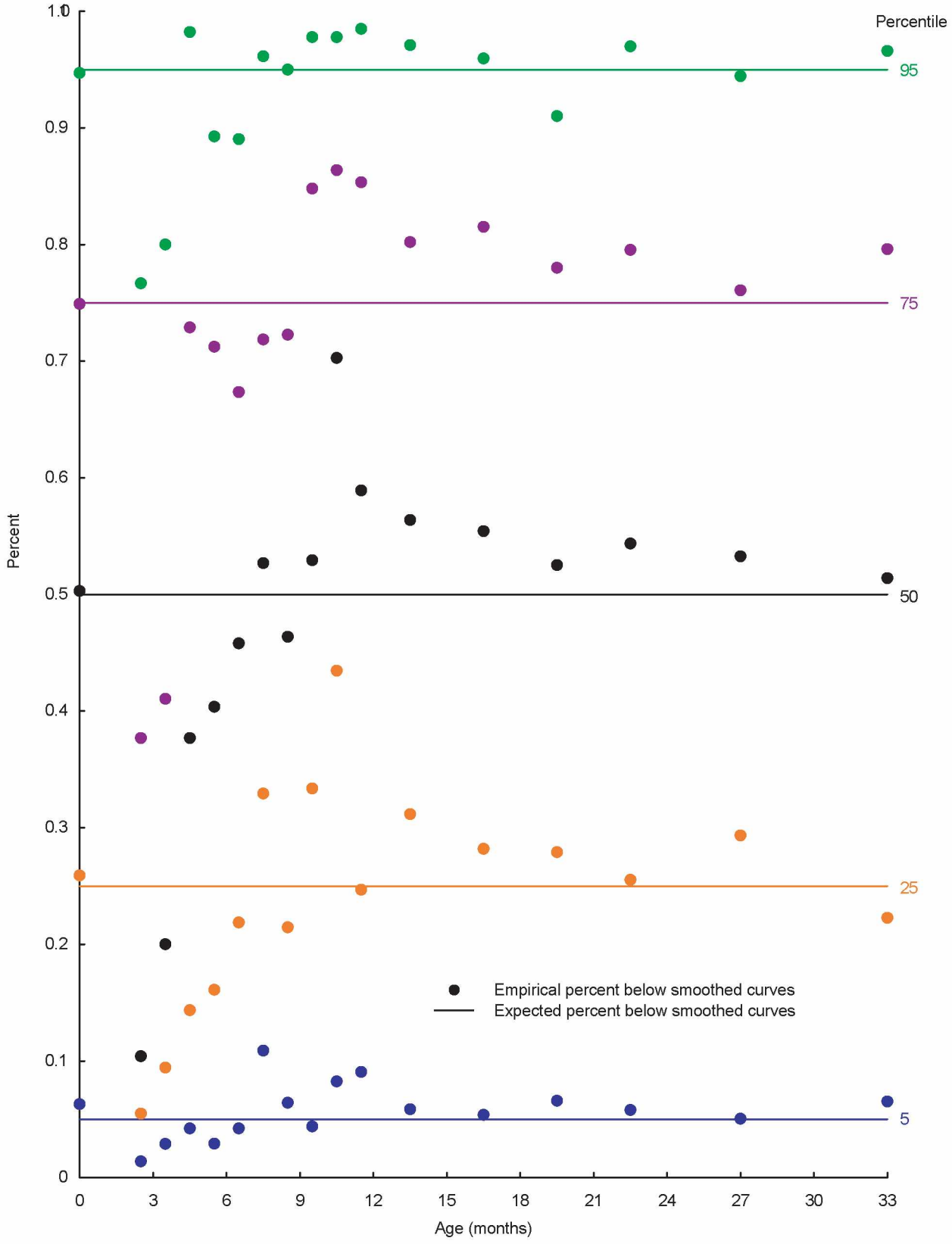


Figure 64. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Boys weight-for-age

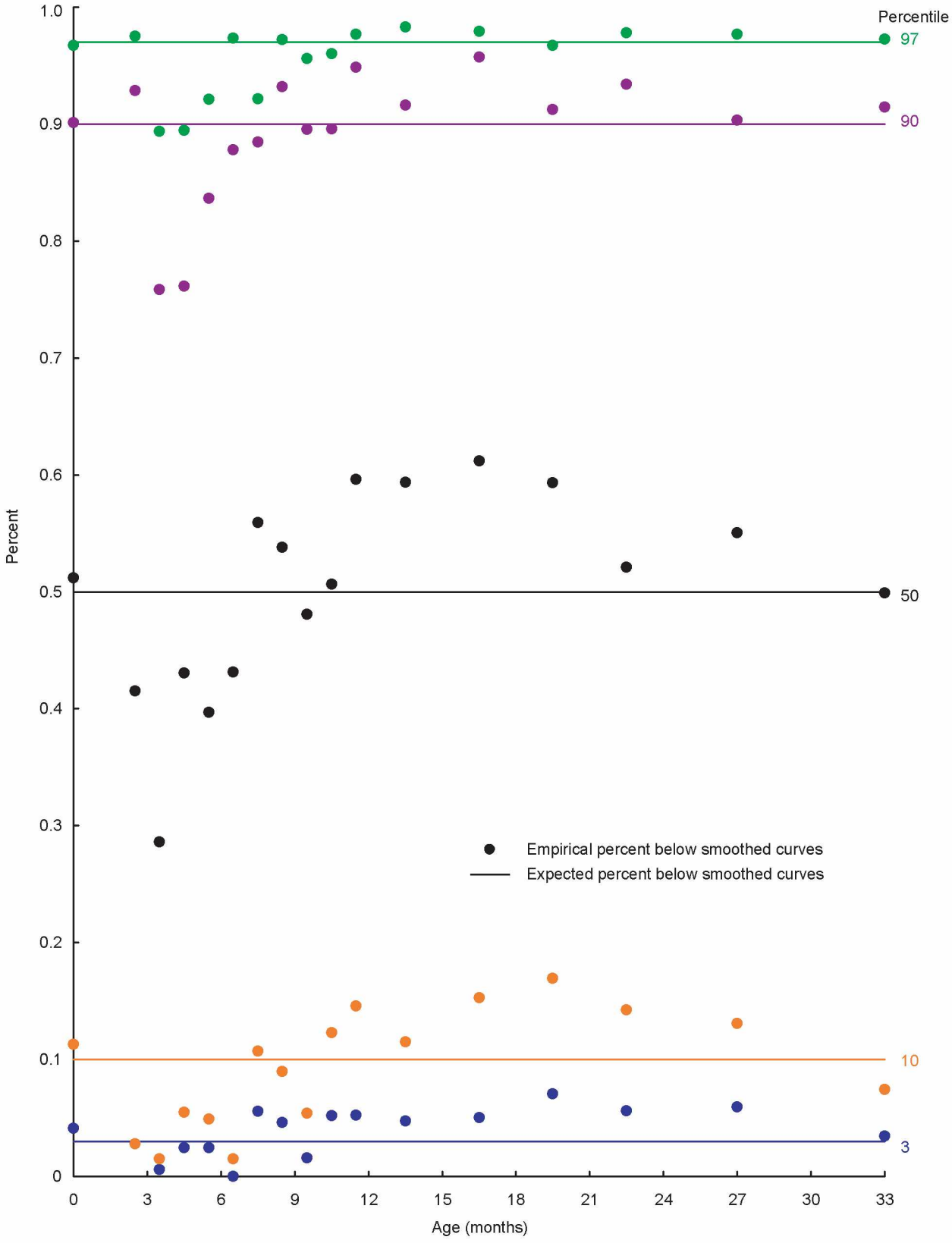


Figure 65. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Girls weight-for-age

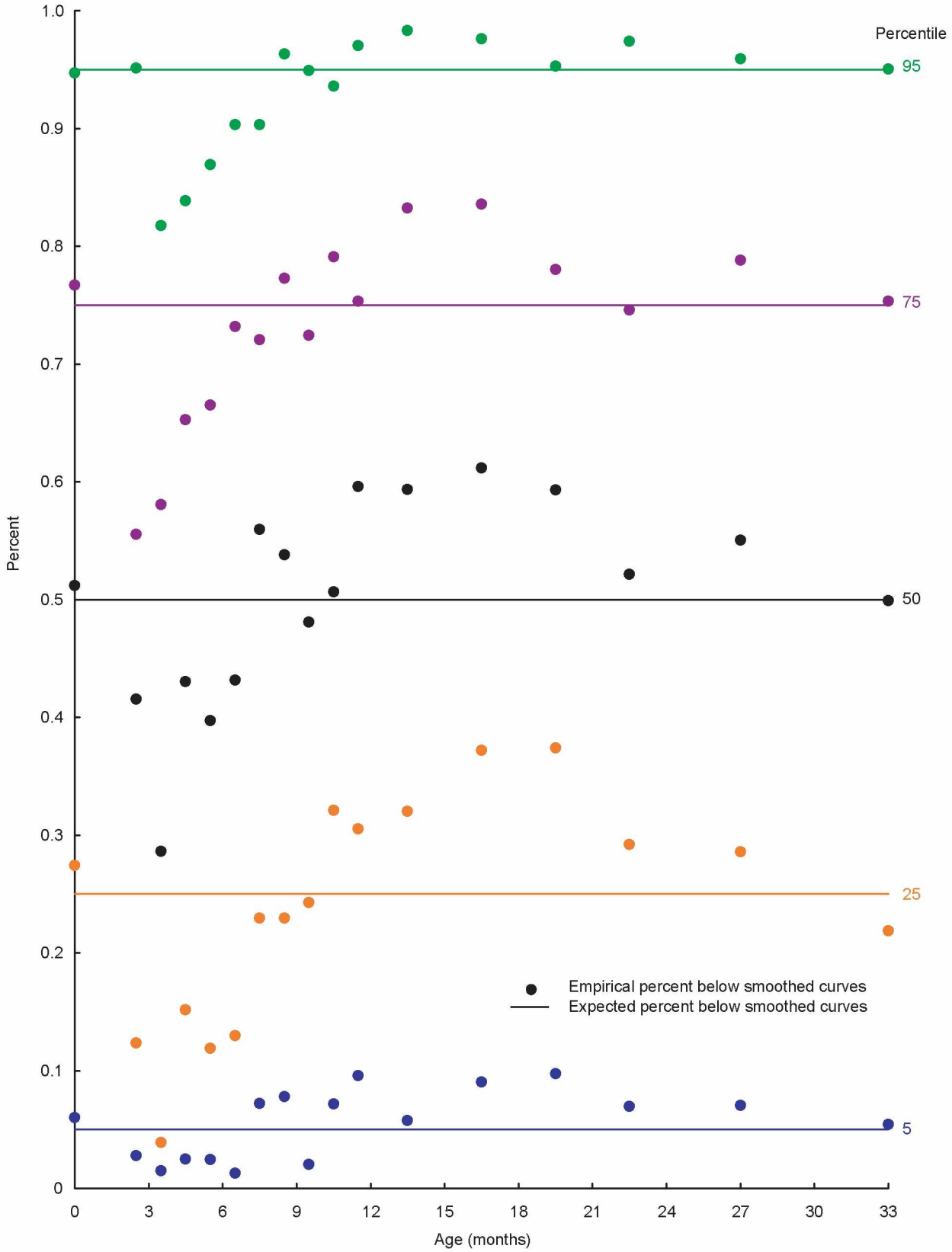


Figure 66. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Girls weight-for-age

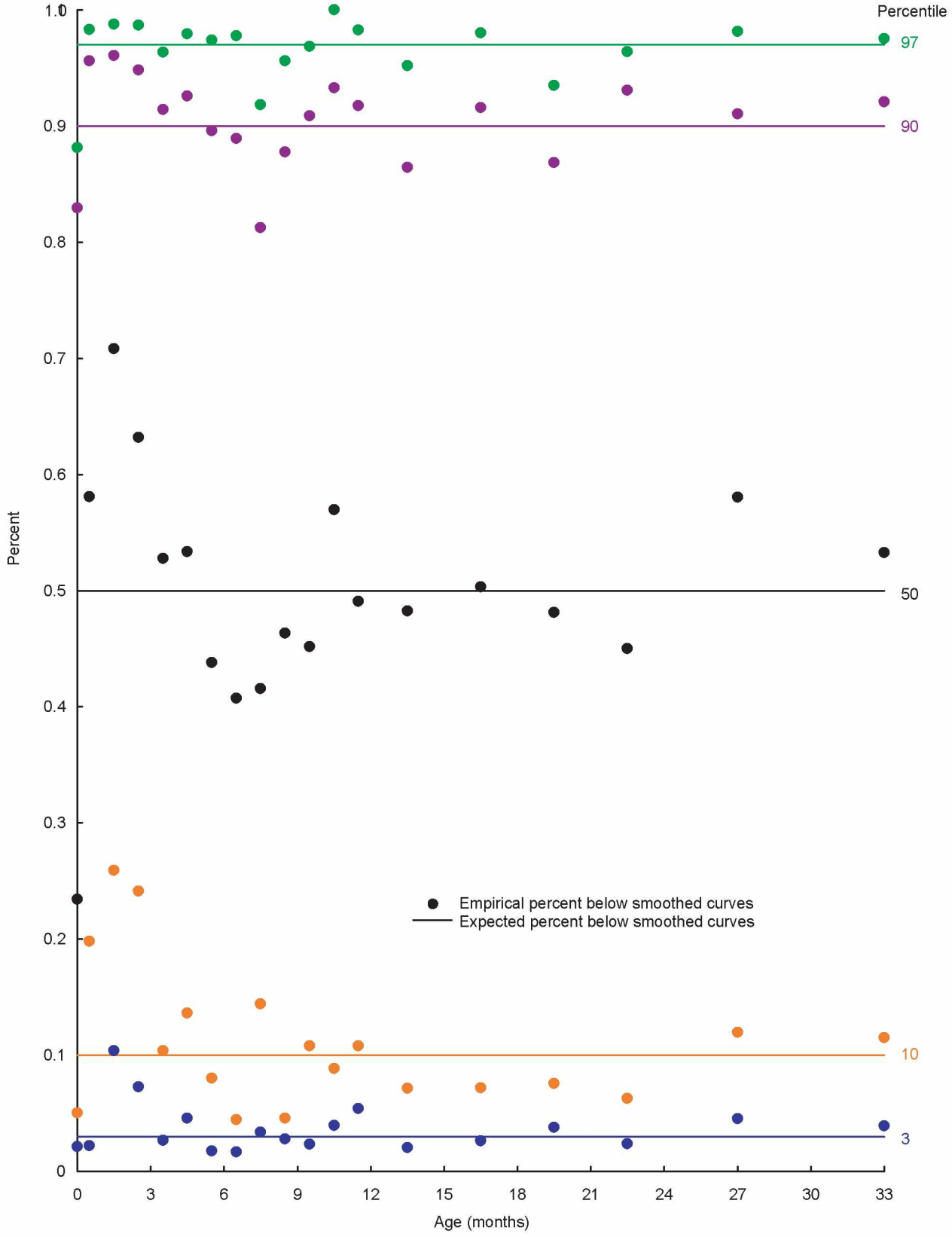


Figure 67. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Boys length-for-age

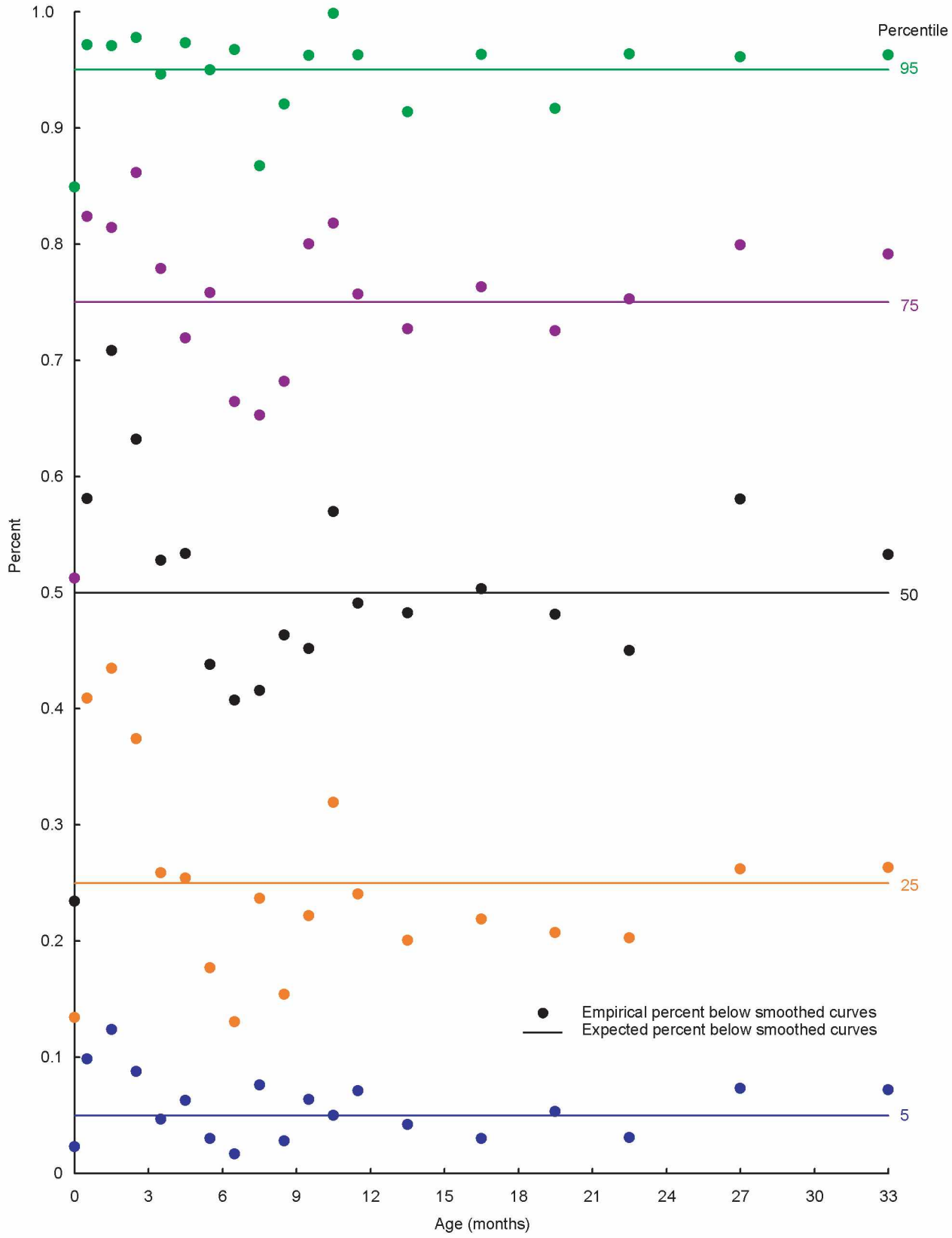


Figure 68. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Boys length-for-age

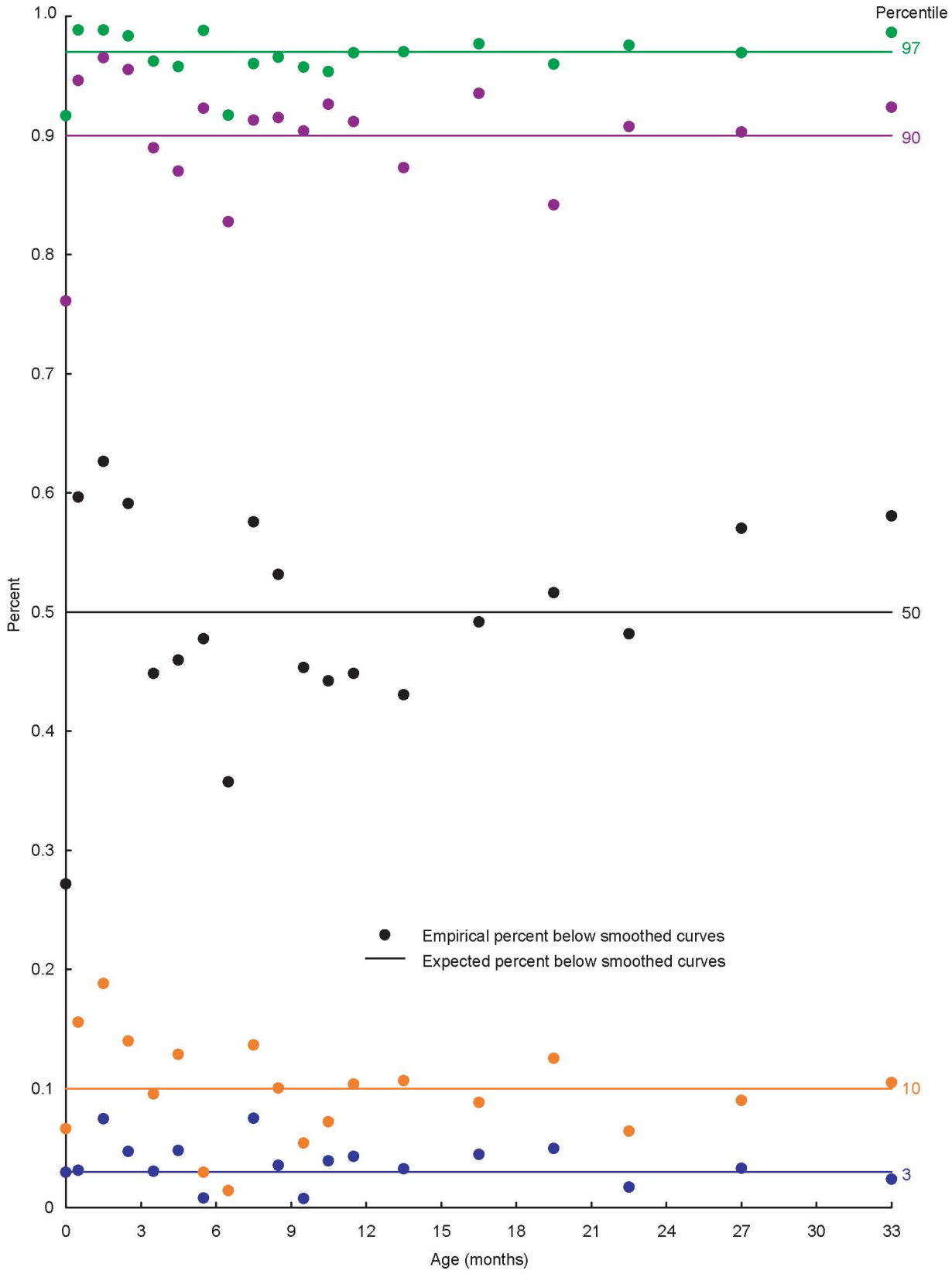


Figure 69. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Girls length-for-age

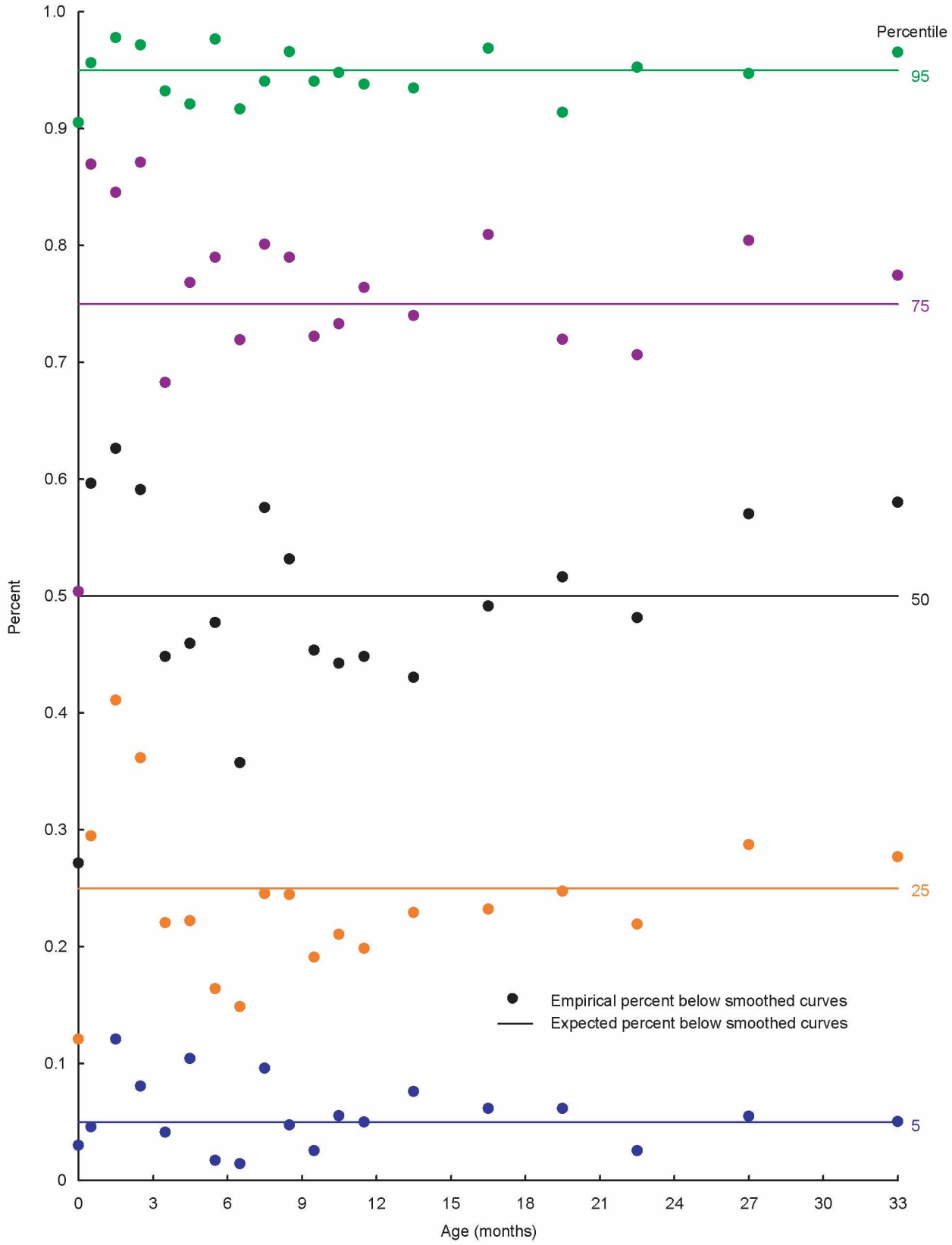


Figure 70. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Girls length-for-age

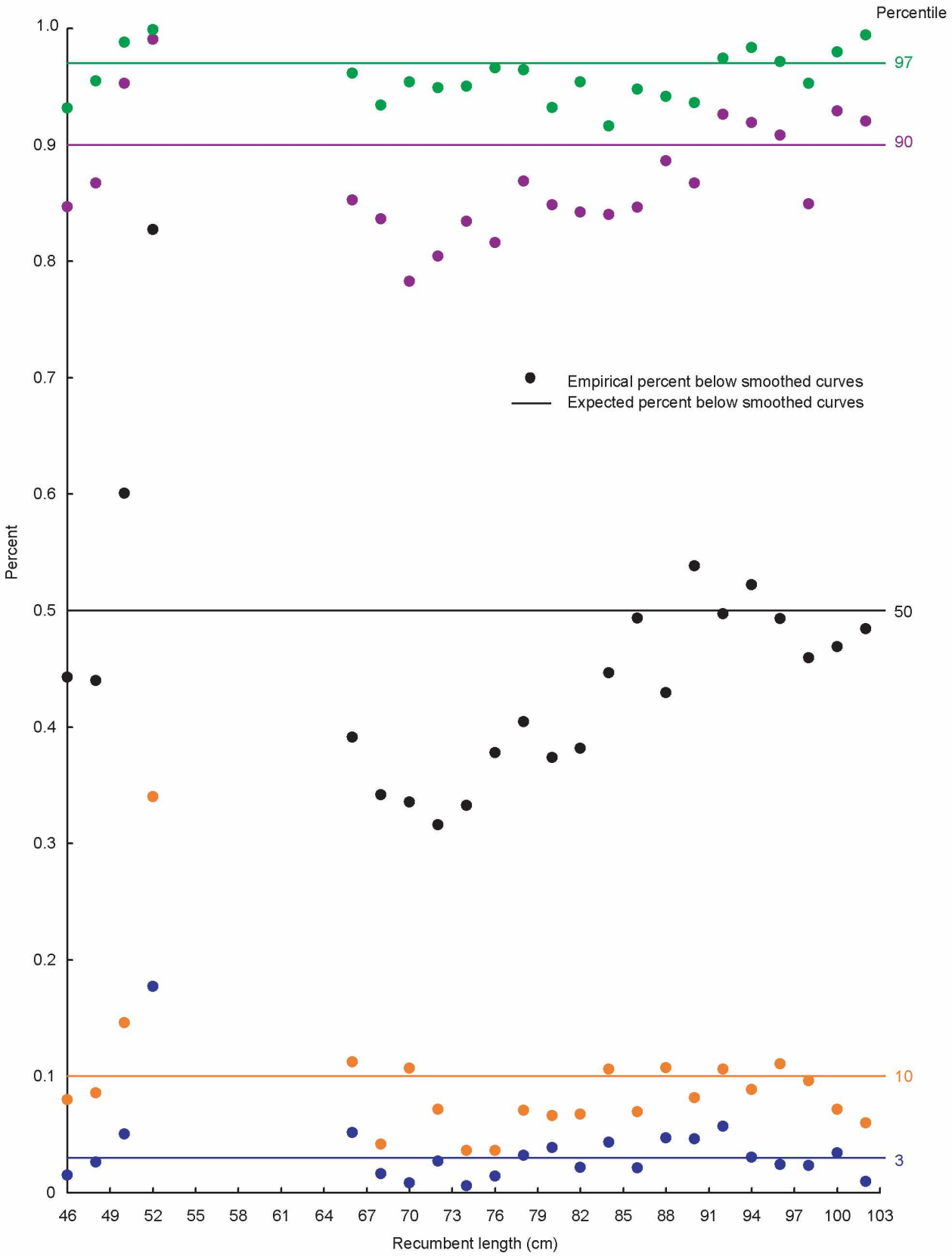


Figure 71. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 46–103 cm: Boys weight-for-length

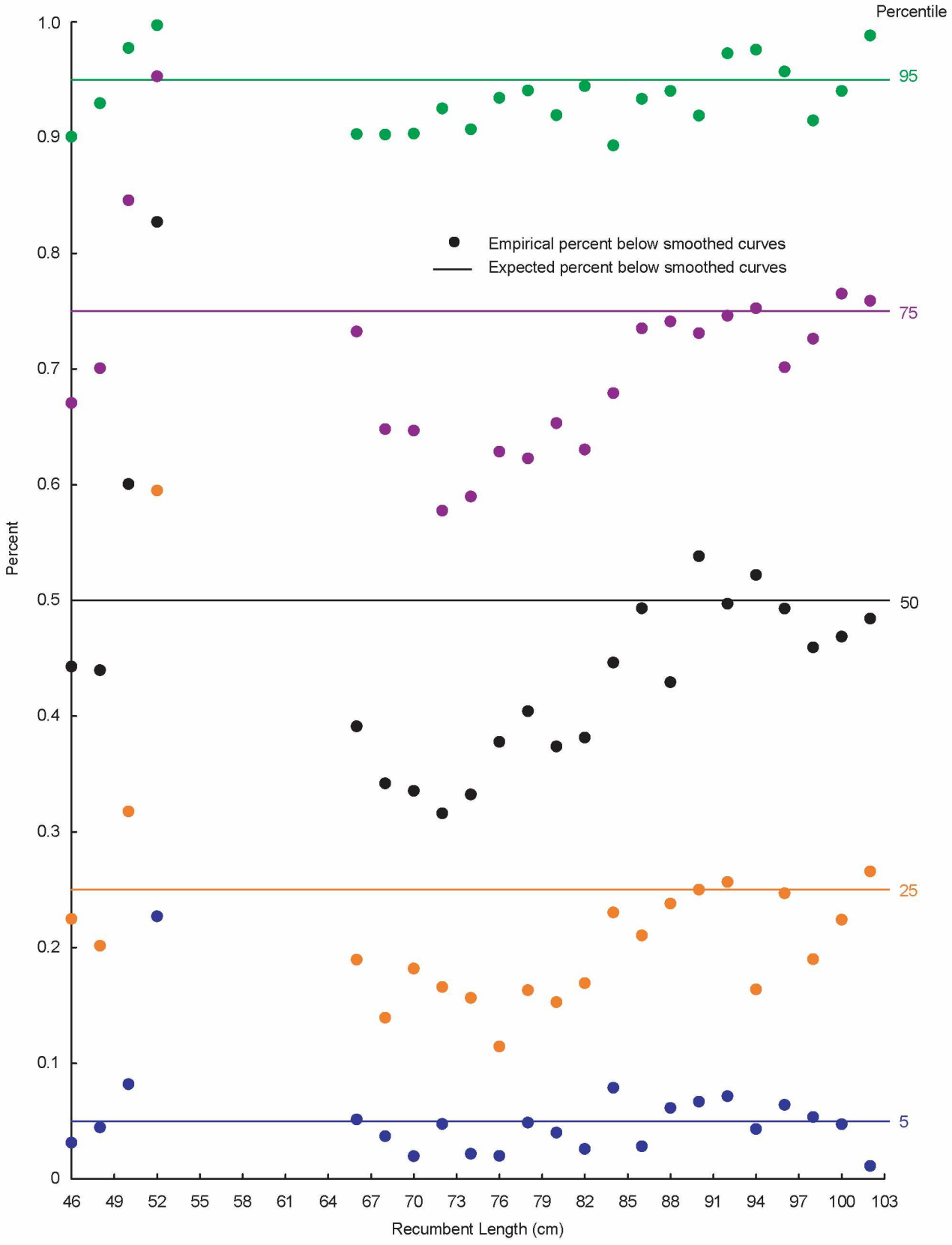


Figure 72. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 46–103 cm: Boys weight-for-length

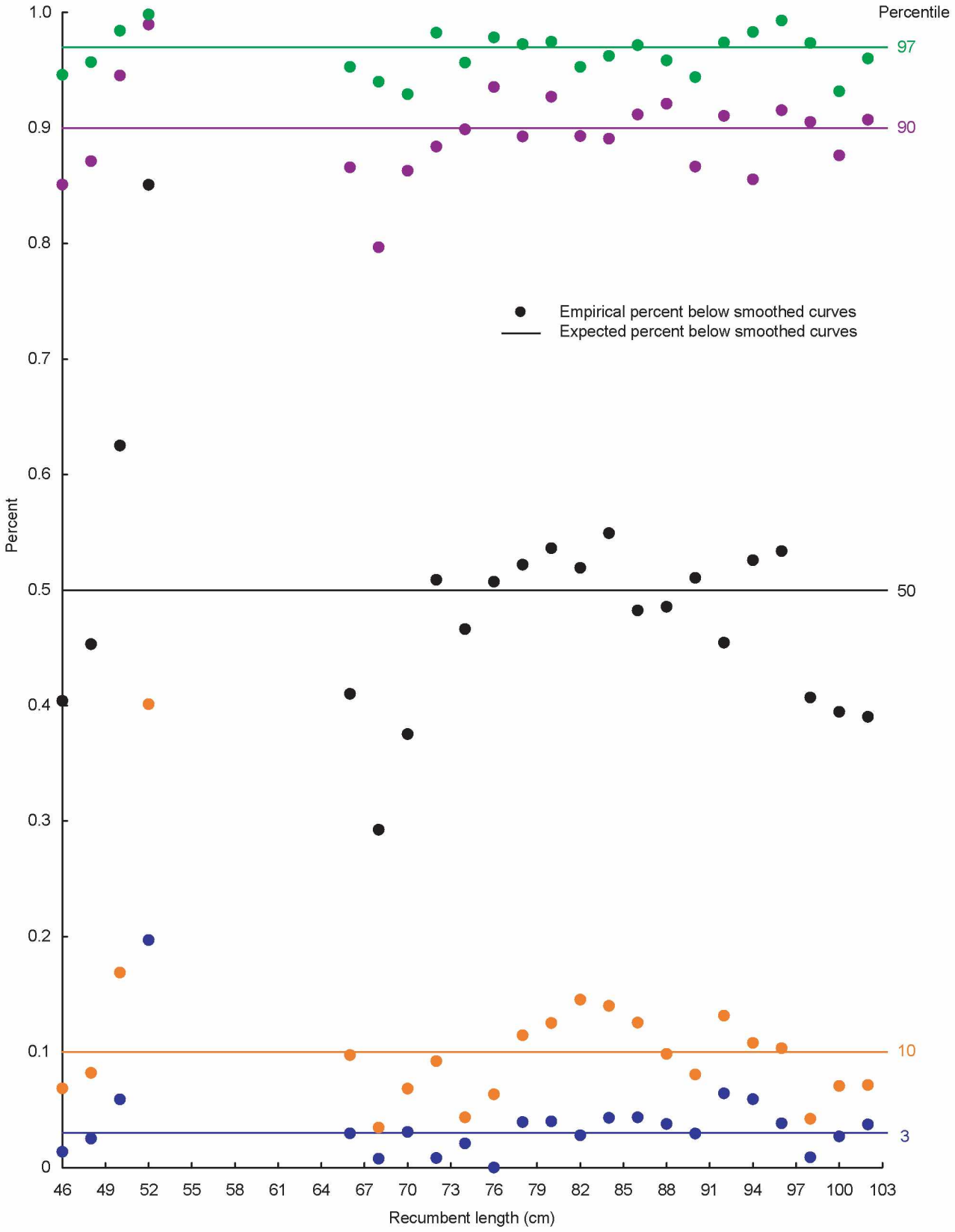


Figure 73. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 46–103 cm: Girls weight-for-length

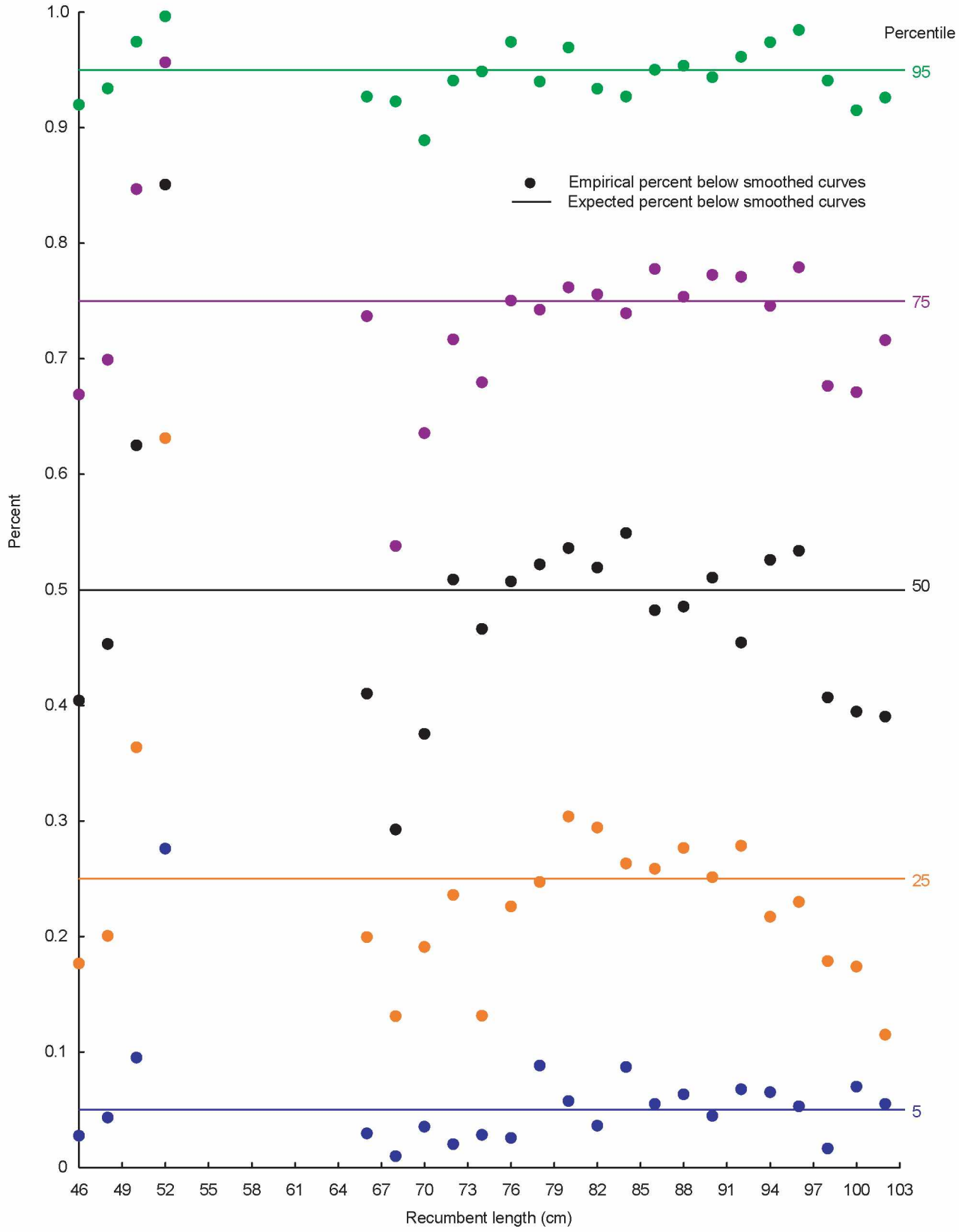


Figure 74. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 46–103 cm: Girls weight-for-length

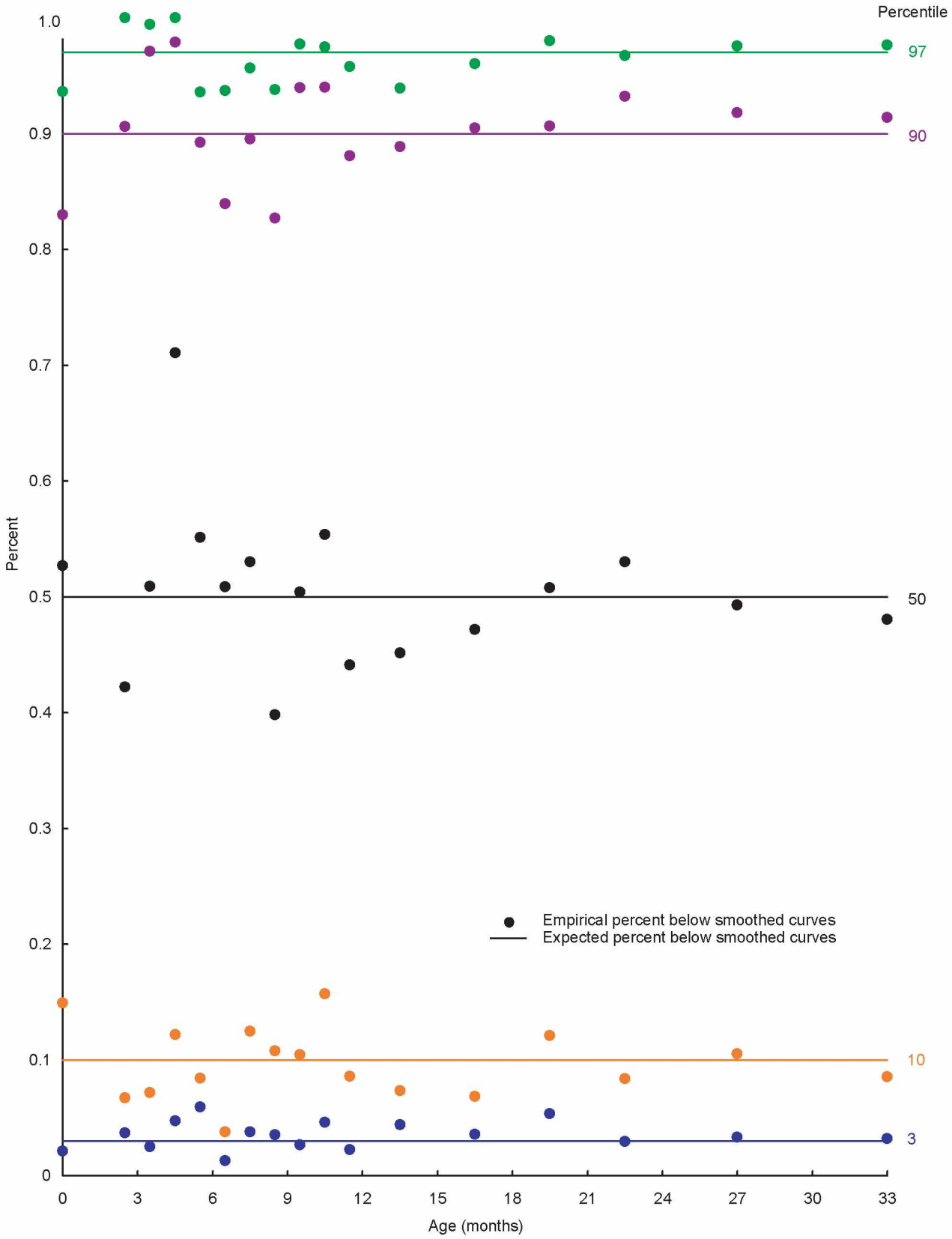


Figure 75. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Boys head circumference-for-age

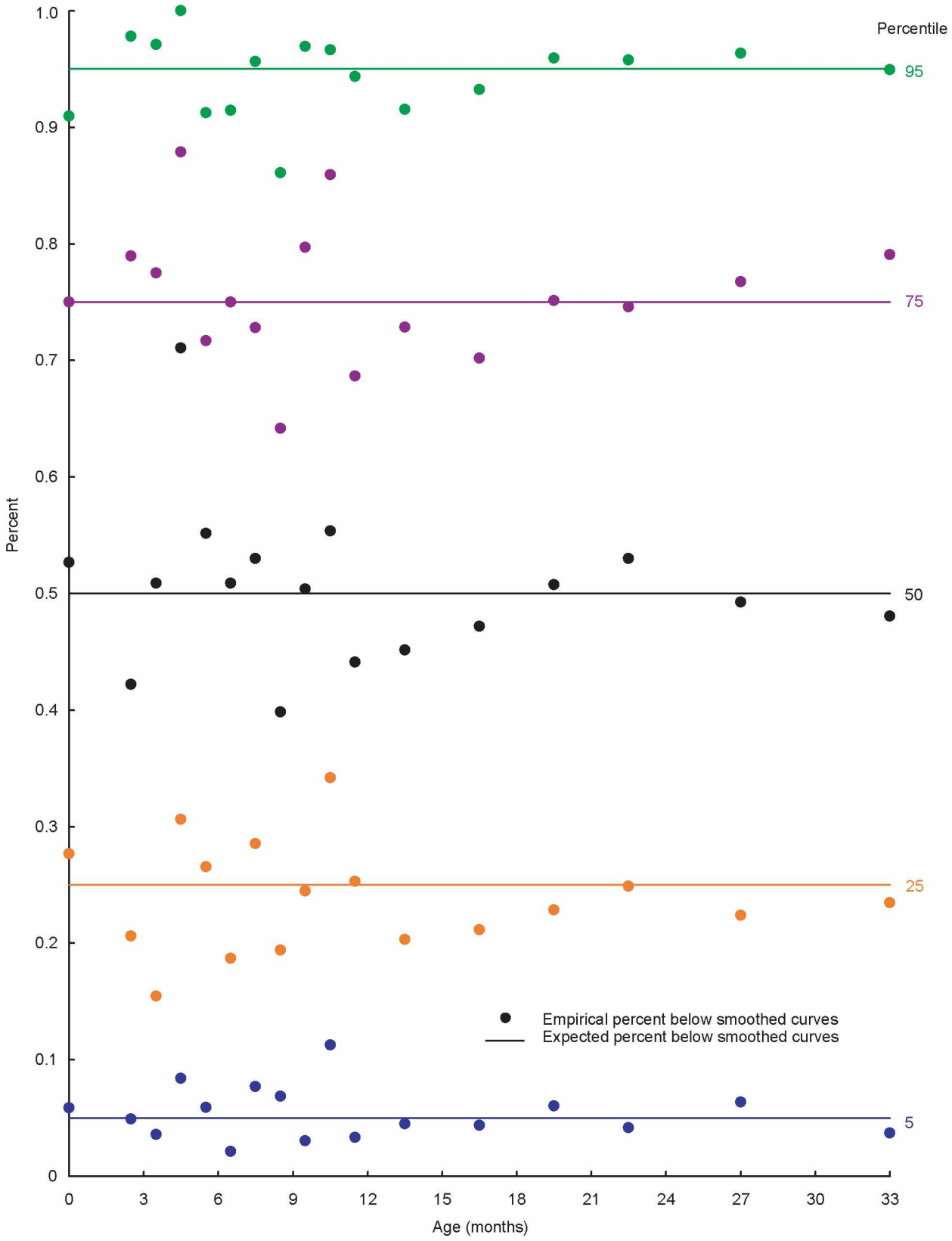


Figure 76. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Boys head circumference-for-age

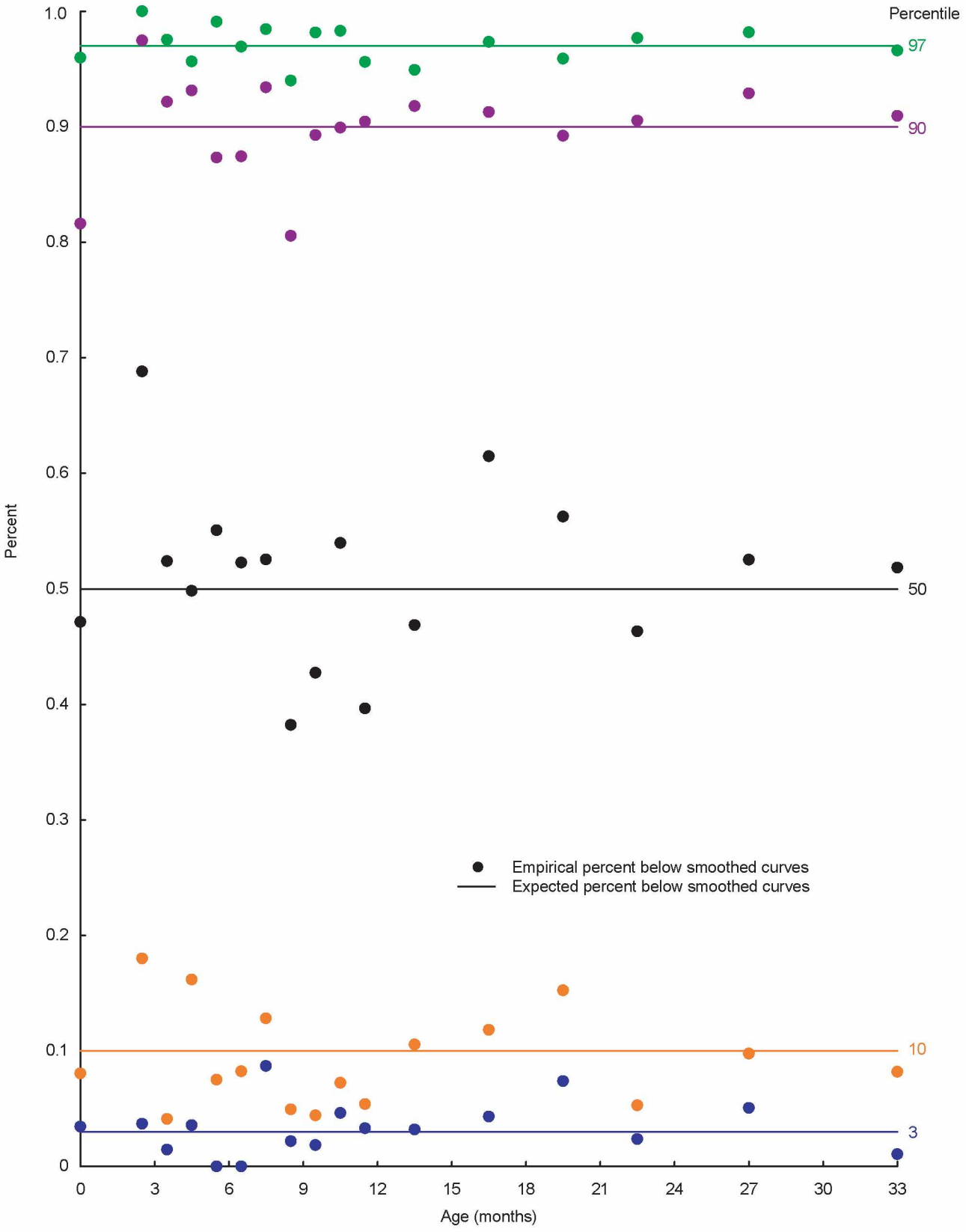


Figure 77. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, birth to 33 months: Girls head circumference-for-age

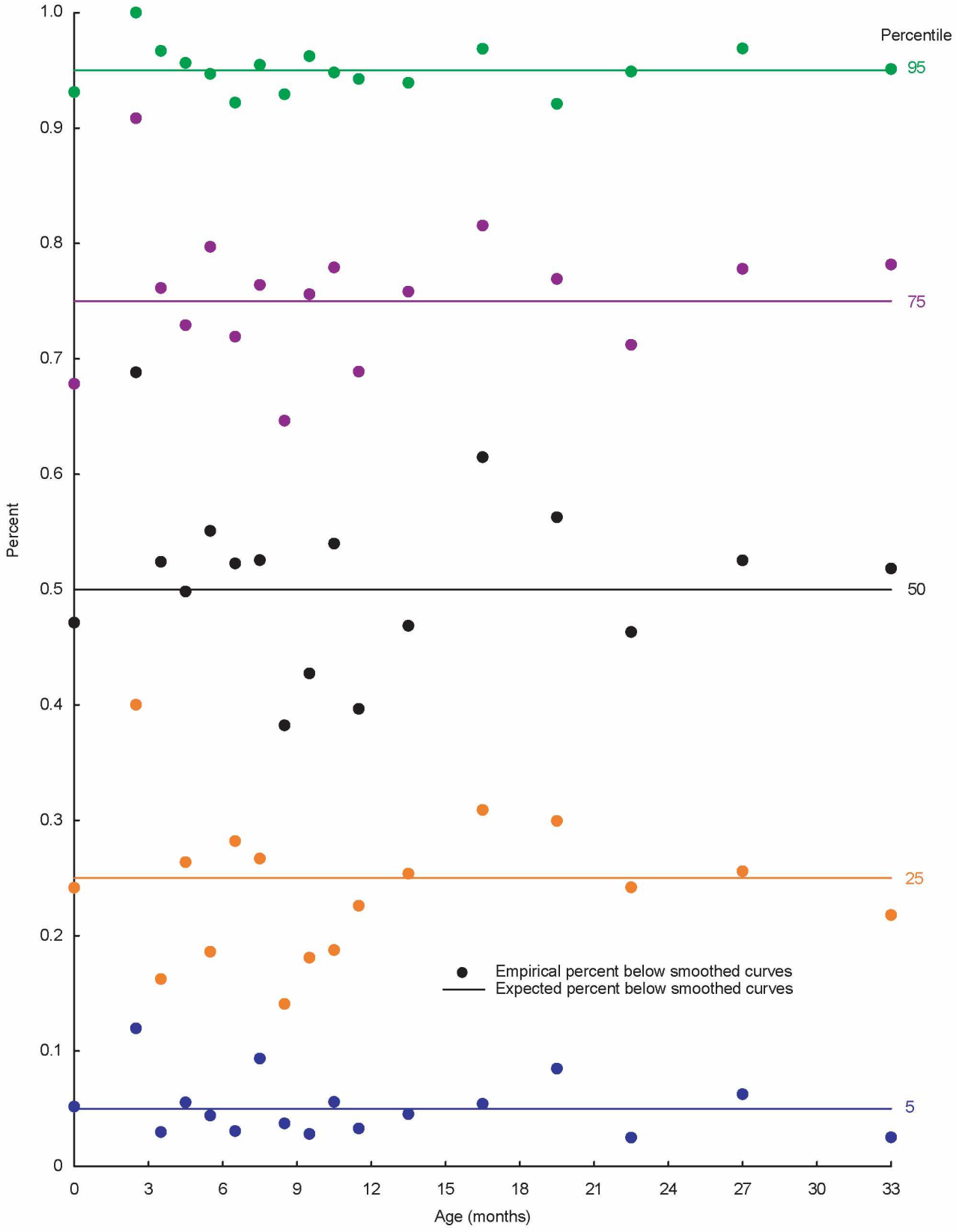


Figure 78. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, birth to 33 months: Girls head circumference-for-age

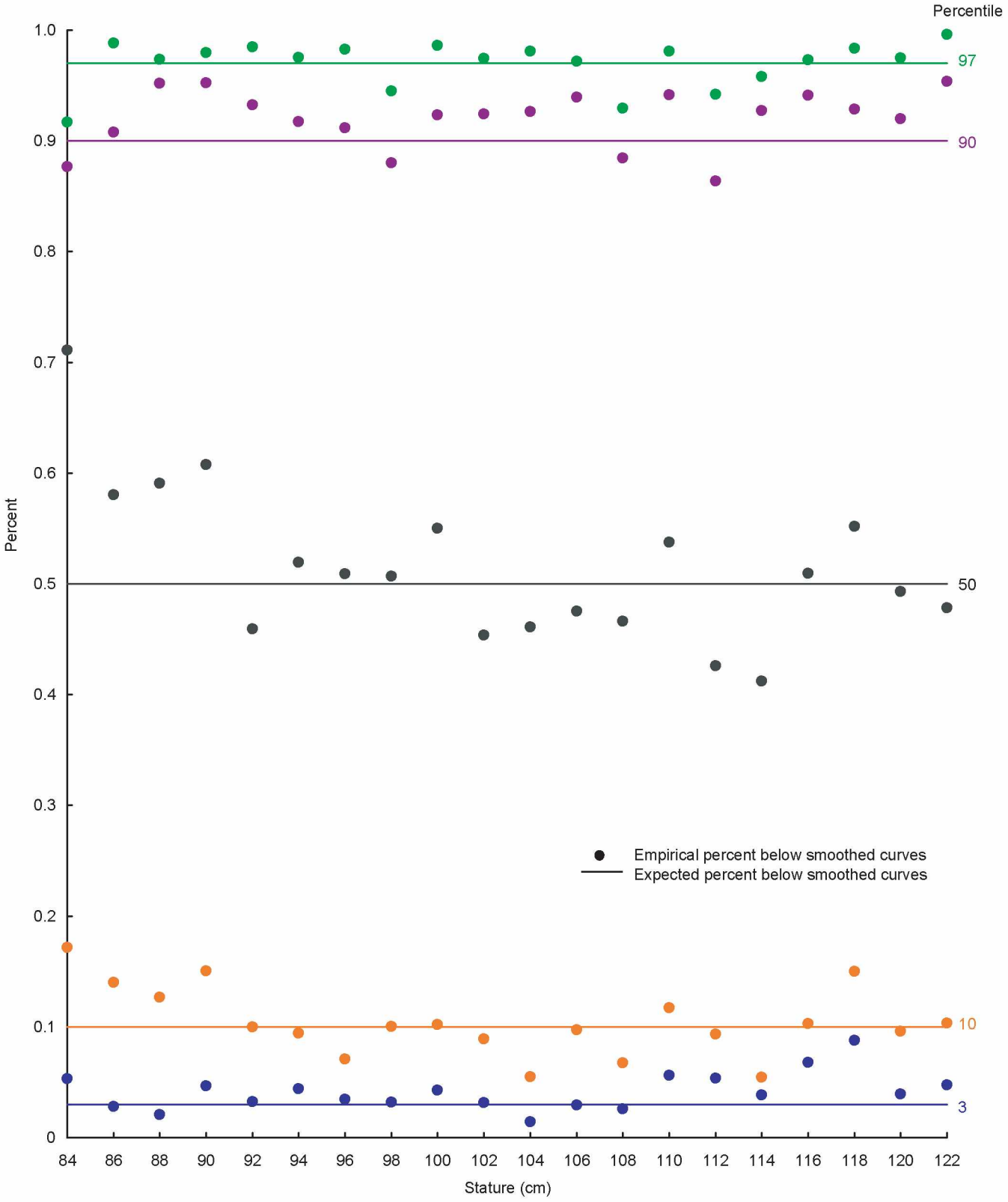


Figure 79. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 84–122 cm: Boys weight-for-stature

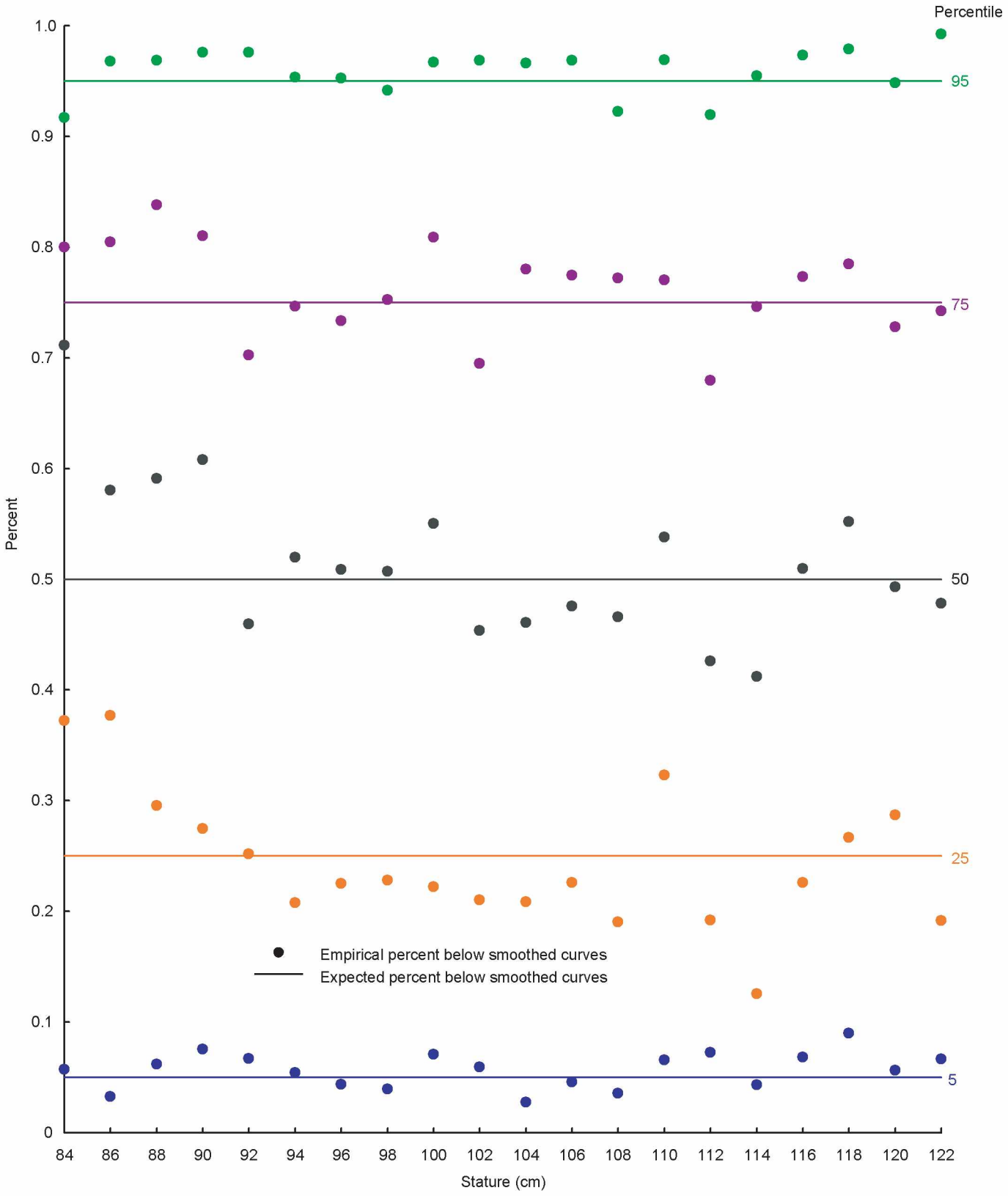


Figure 80. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 84–122 cm: Boys weight-for-stature

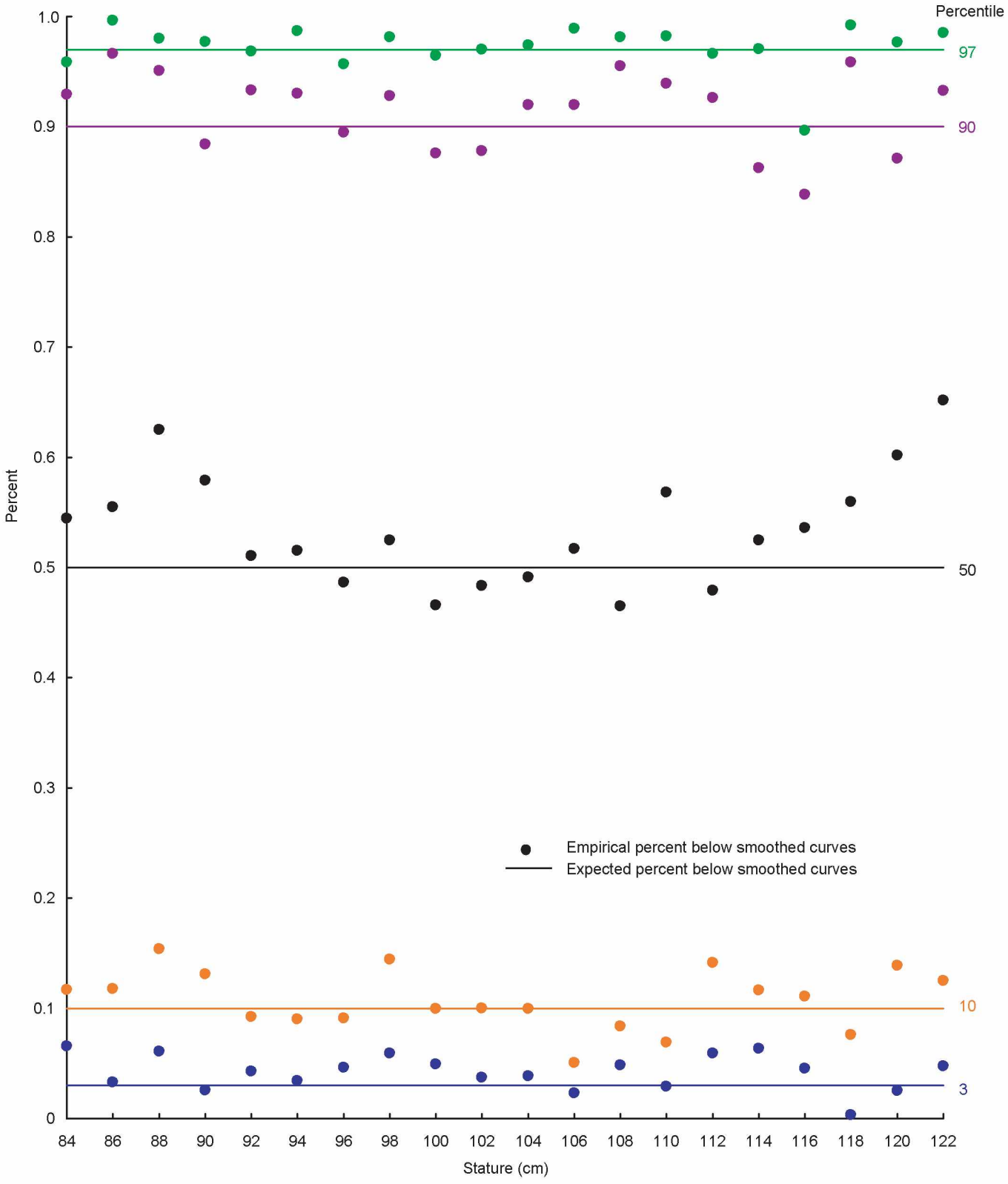


Figure 81. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 84–122 cm: Girls weight-for-stature

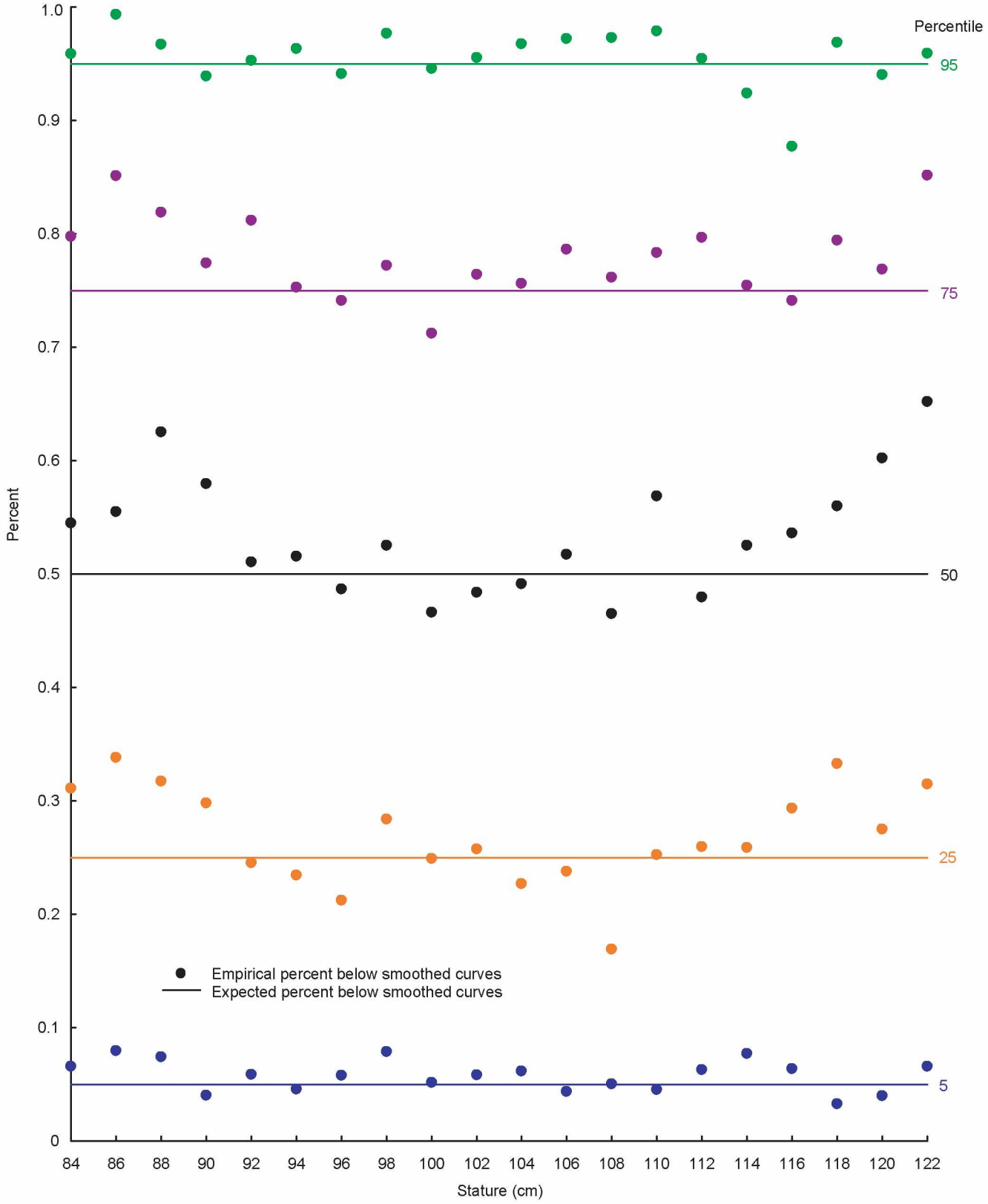


Figure 82. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 84–122 cm: Girls weight-for-stature

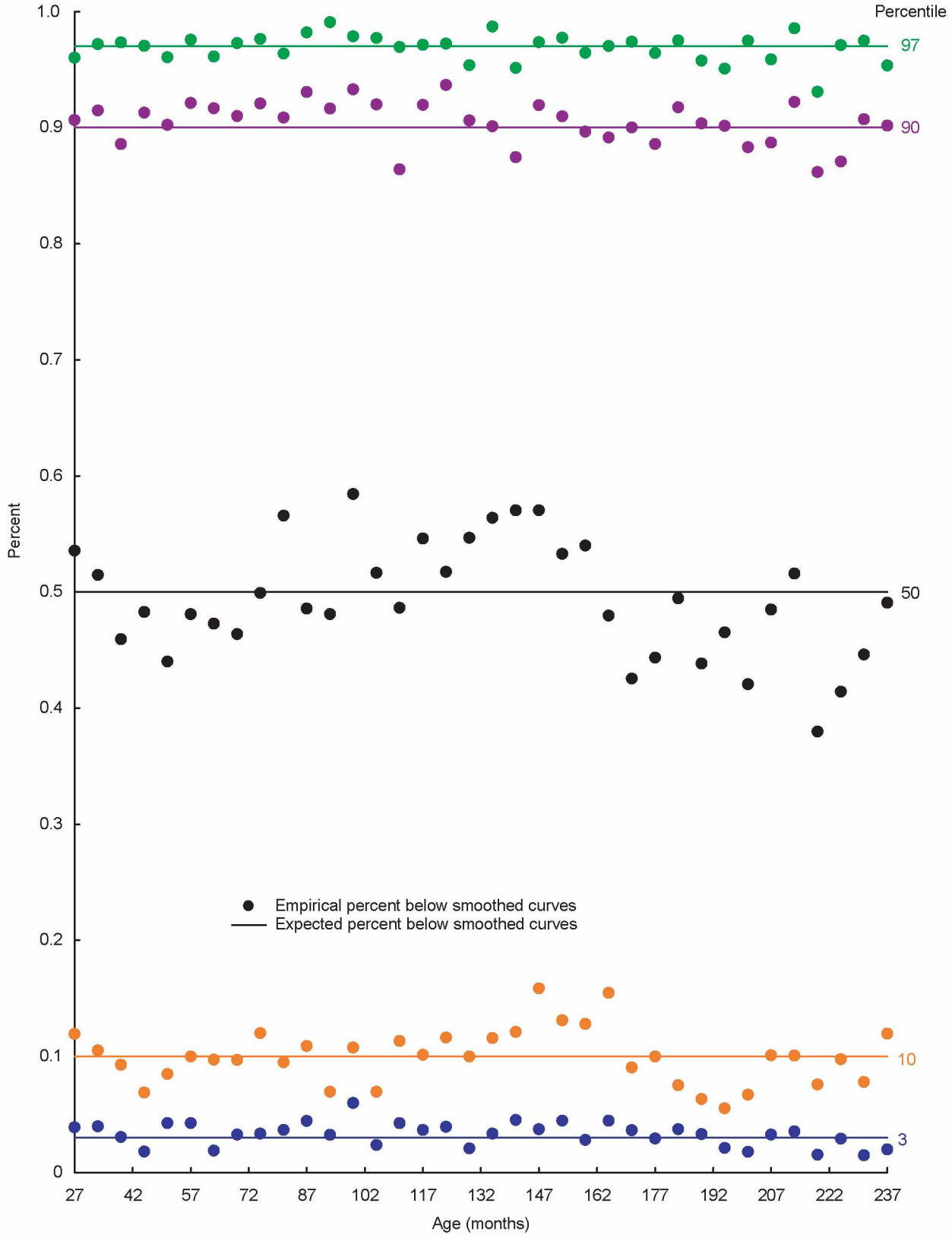


Figure 83. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Boys weight-for-age

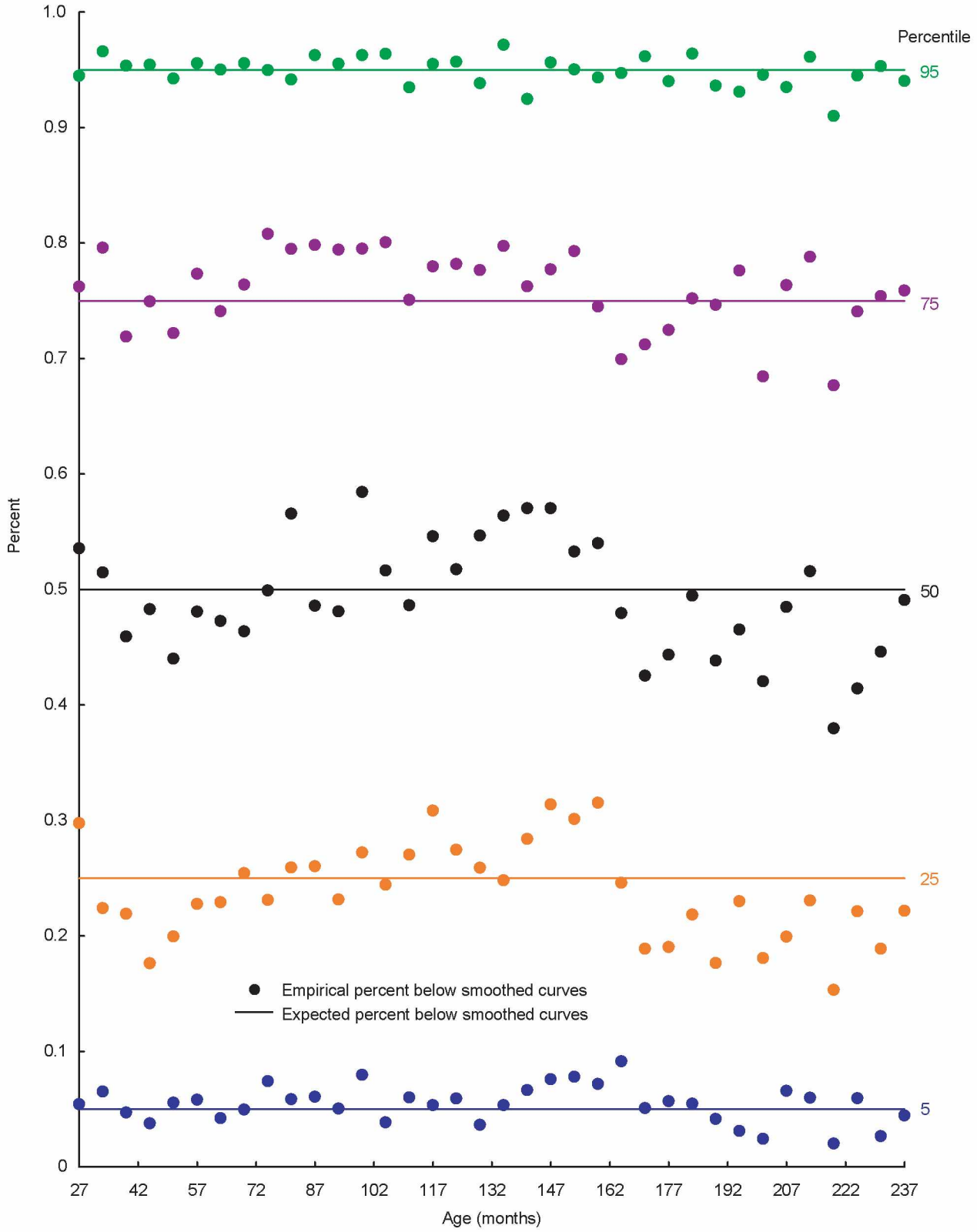


Figure 84. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 27–237 months: Boys weight-for-age

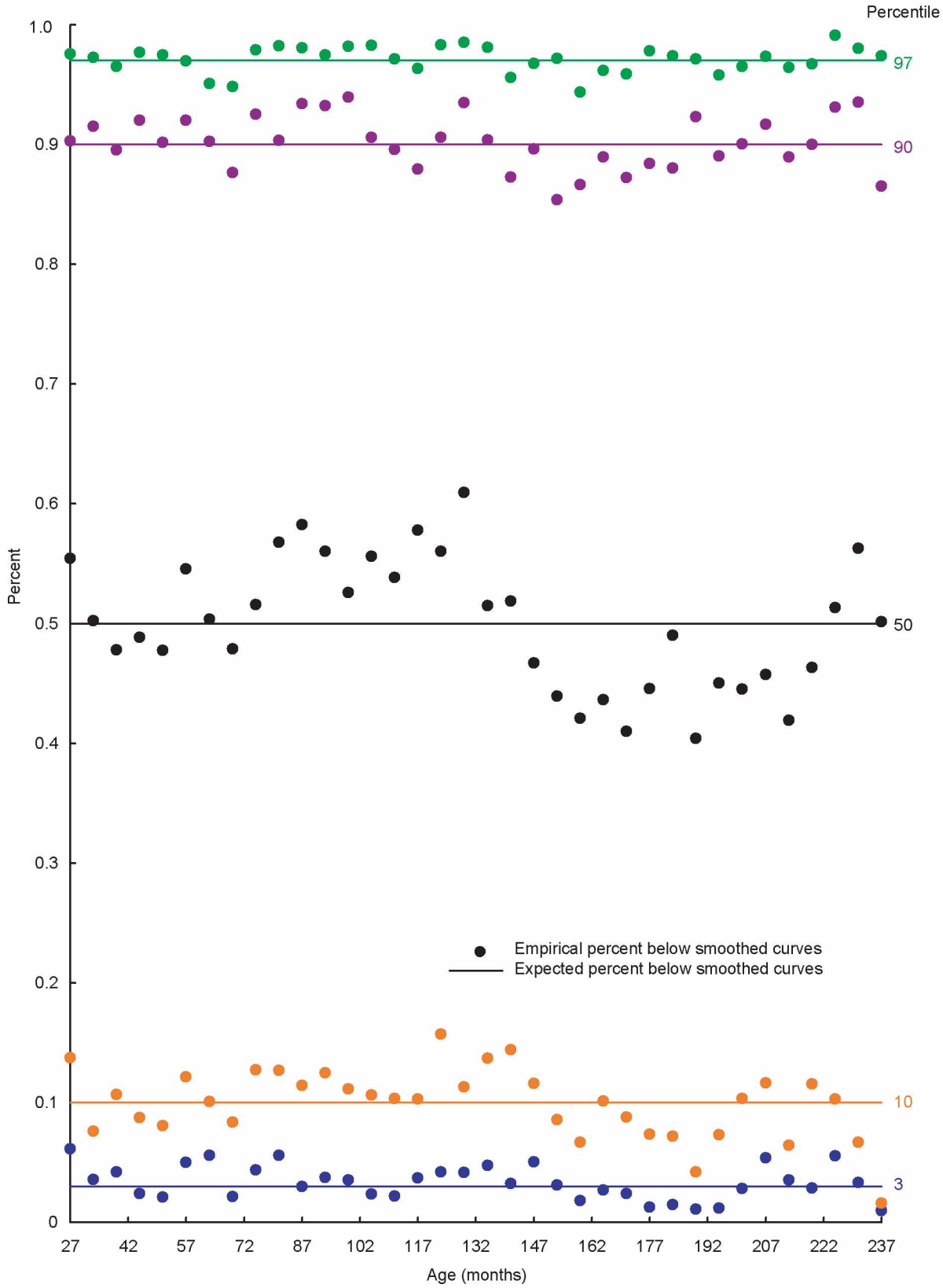


Figure 85. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Girls weight-for-age

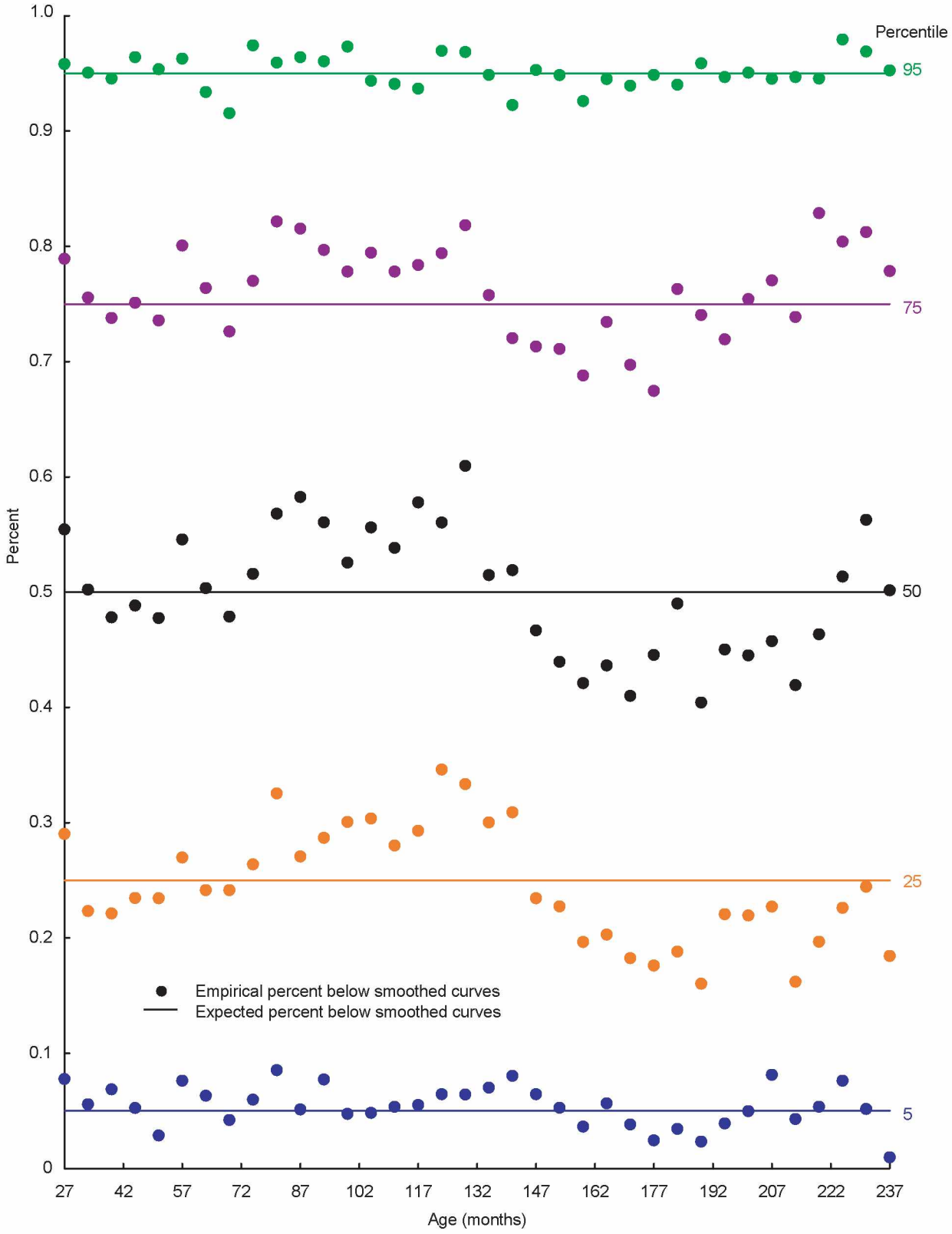


Figure 86. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 27–237 months: Girls weight-for-age

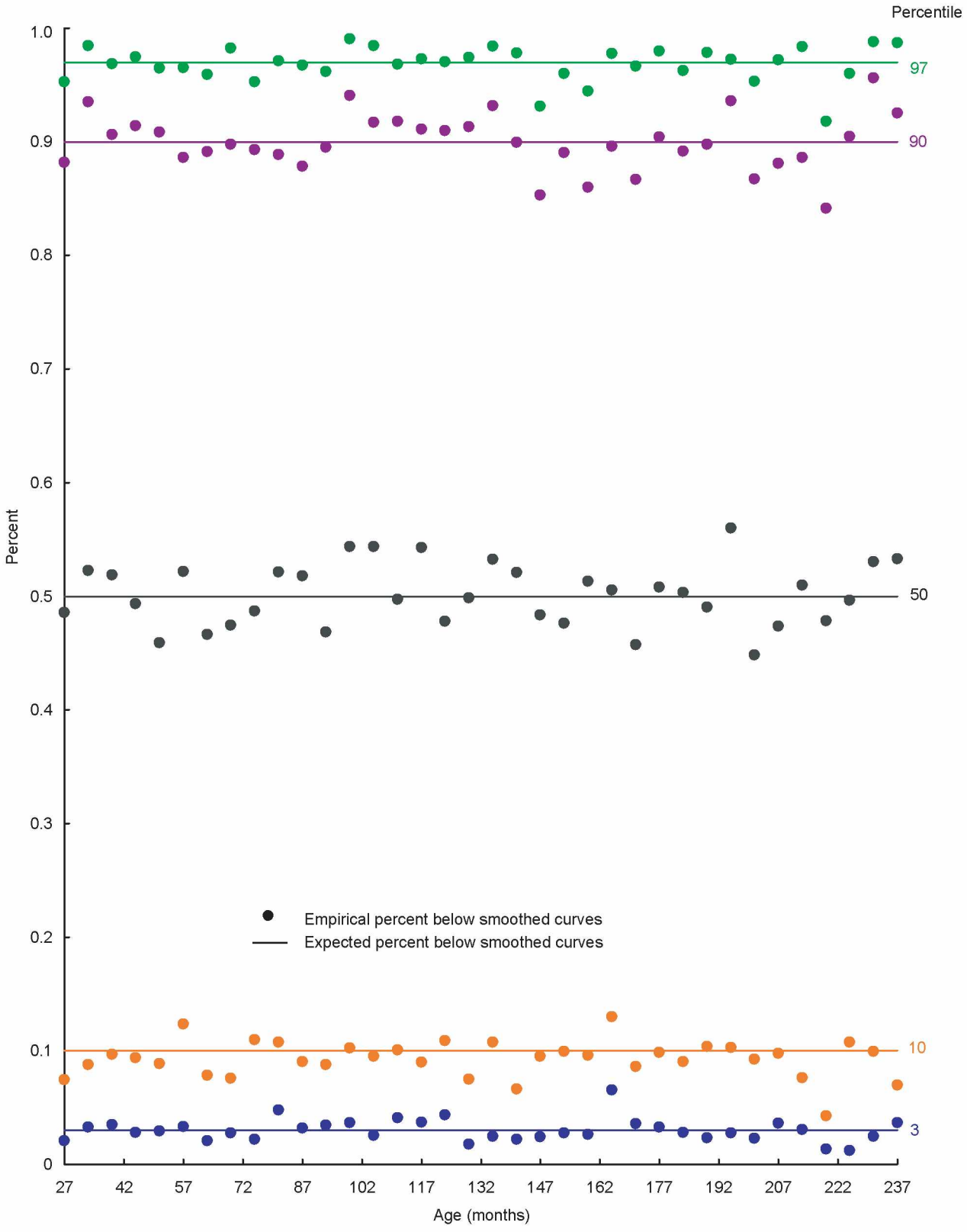


Figure 87. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Boys stature-for-age

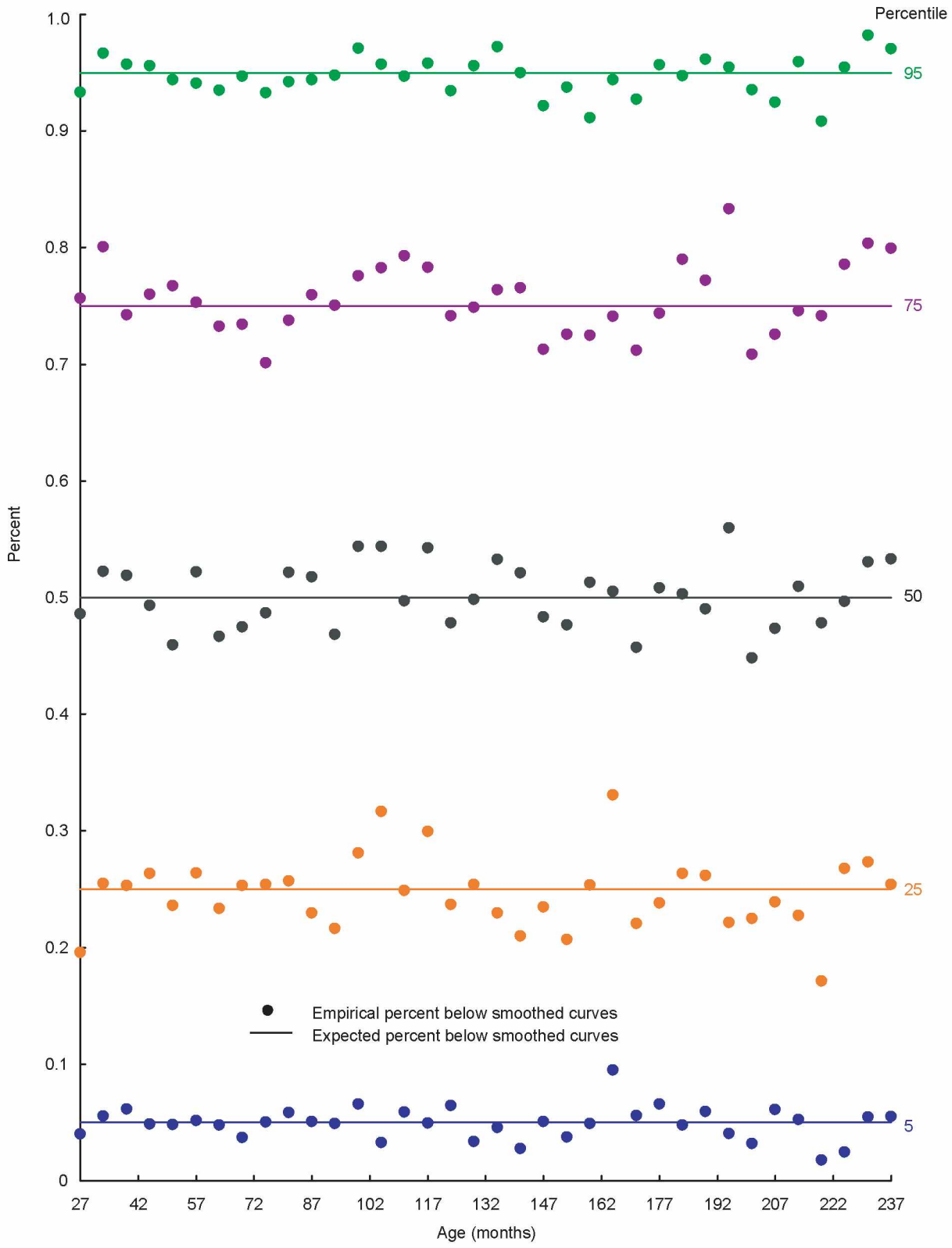


Figure 88. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 27–237 months: Boys stature-for-age

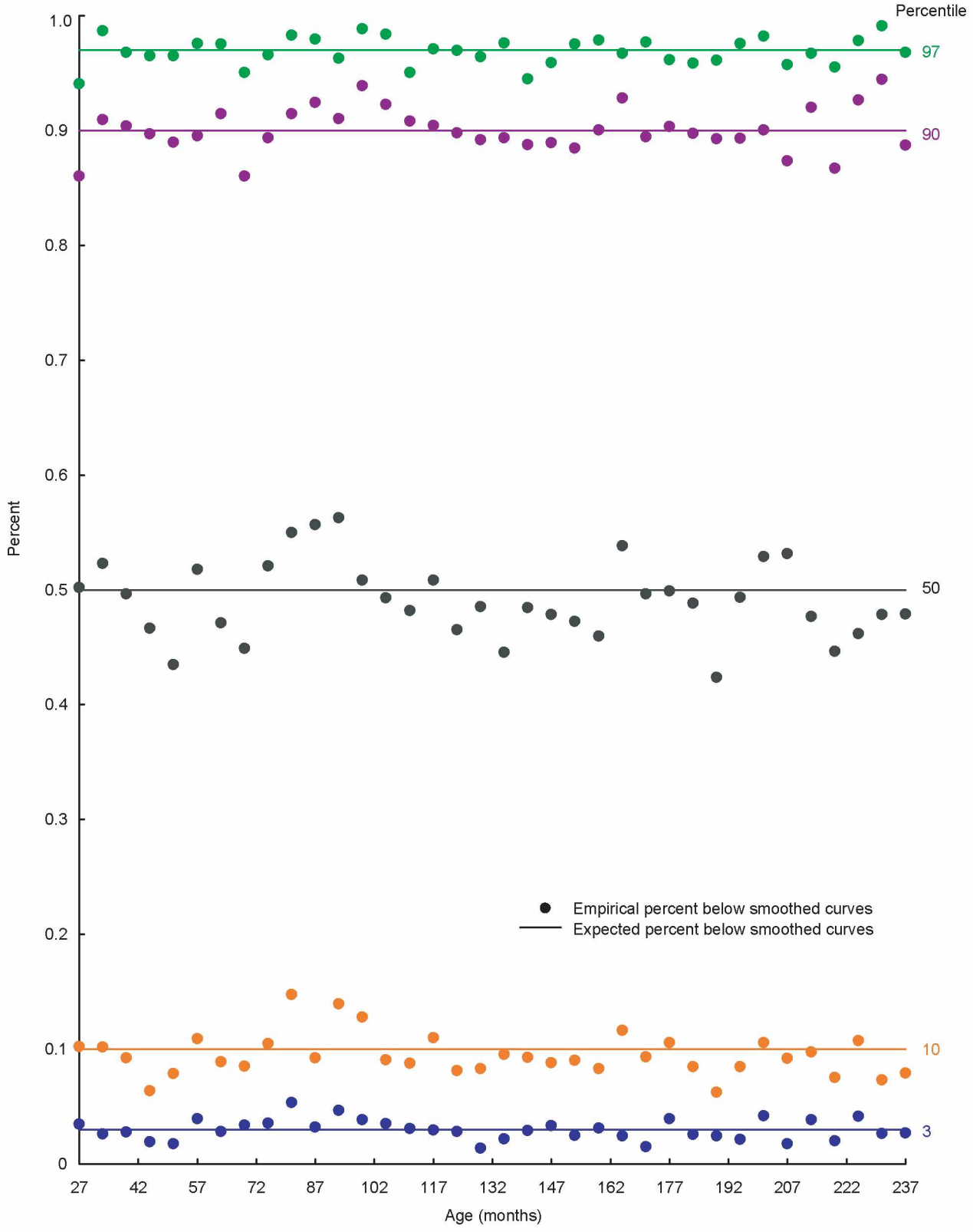


Figure 89. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Girls stature-for-age

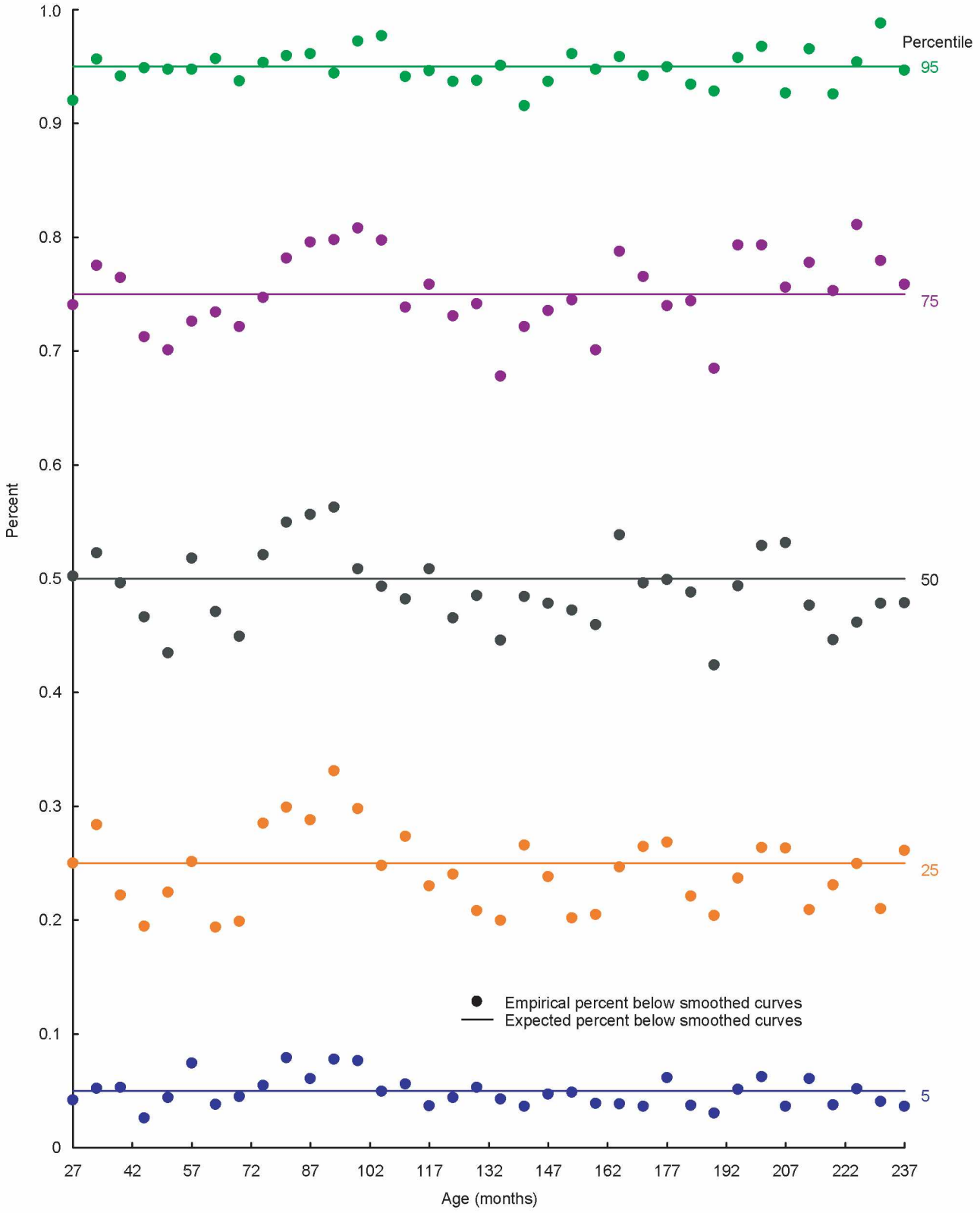


Figure 90. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 95th percentile curves, 27–237 months: Girls stature-for-age

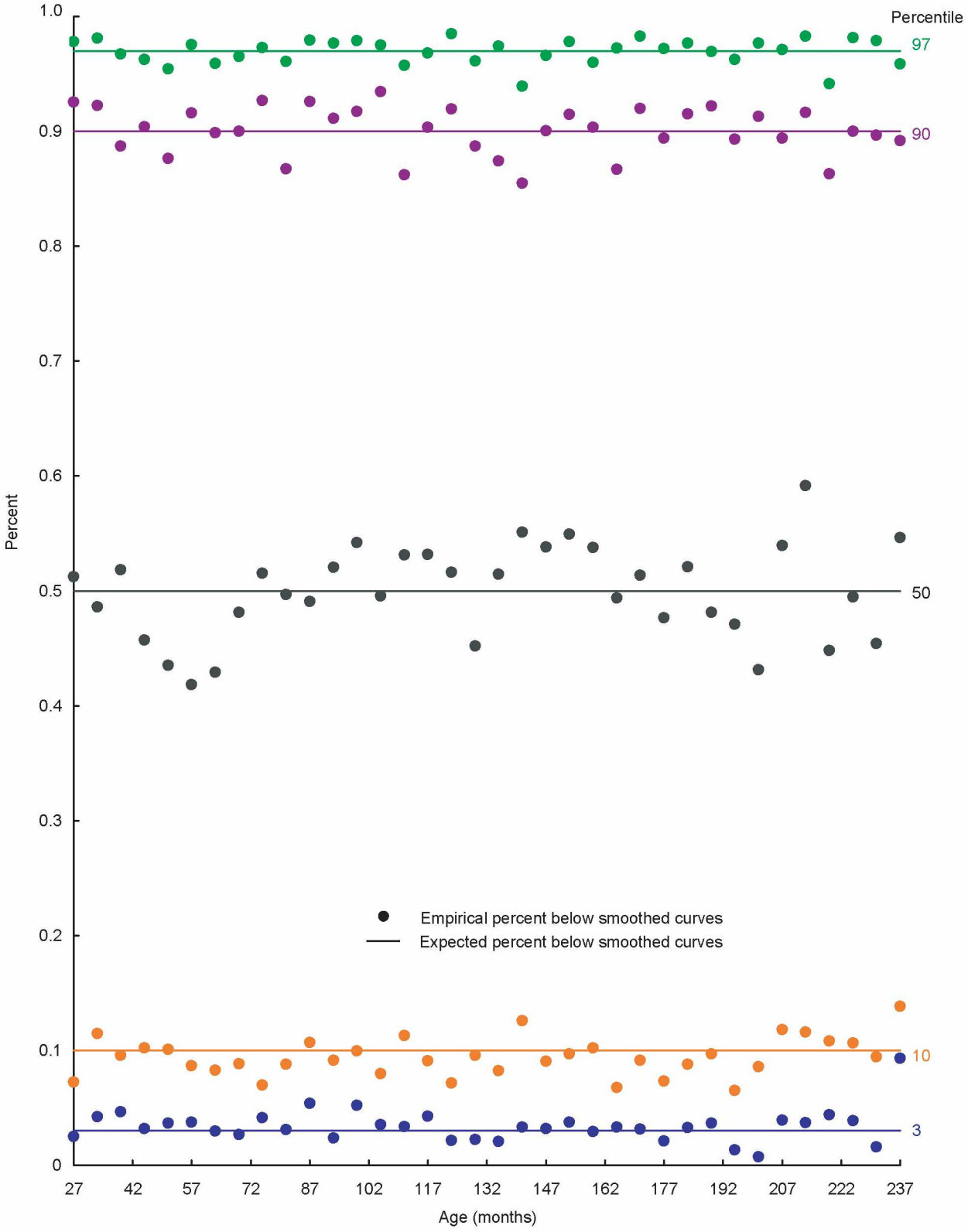


Figure 91. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Boys body mass index-for-age

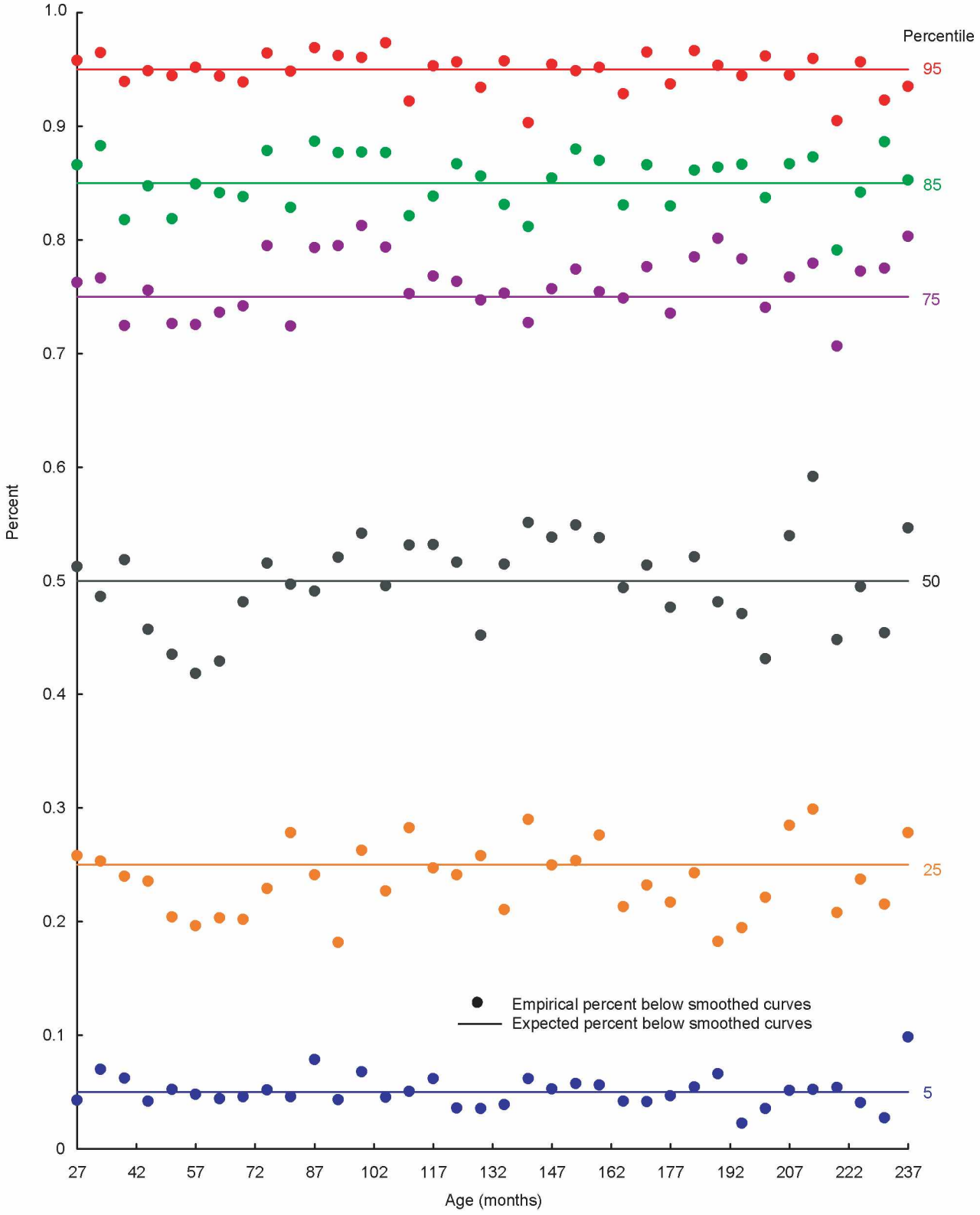


Figure 92. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 85th, 95th percentile curves, 27–237 months: Boys body mass index-for-age

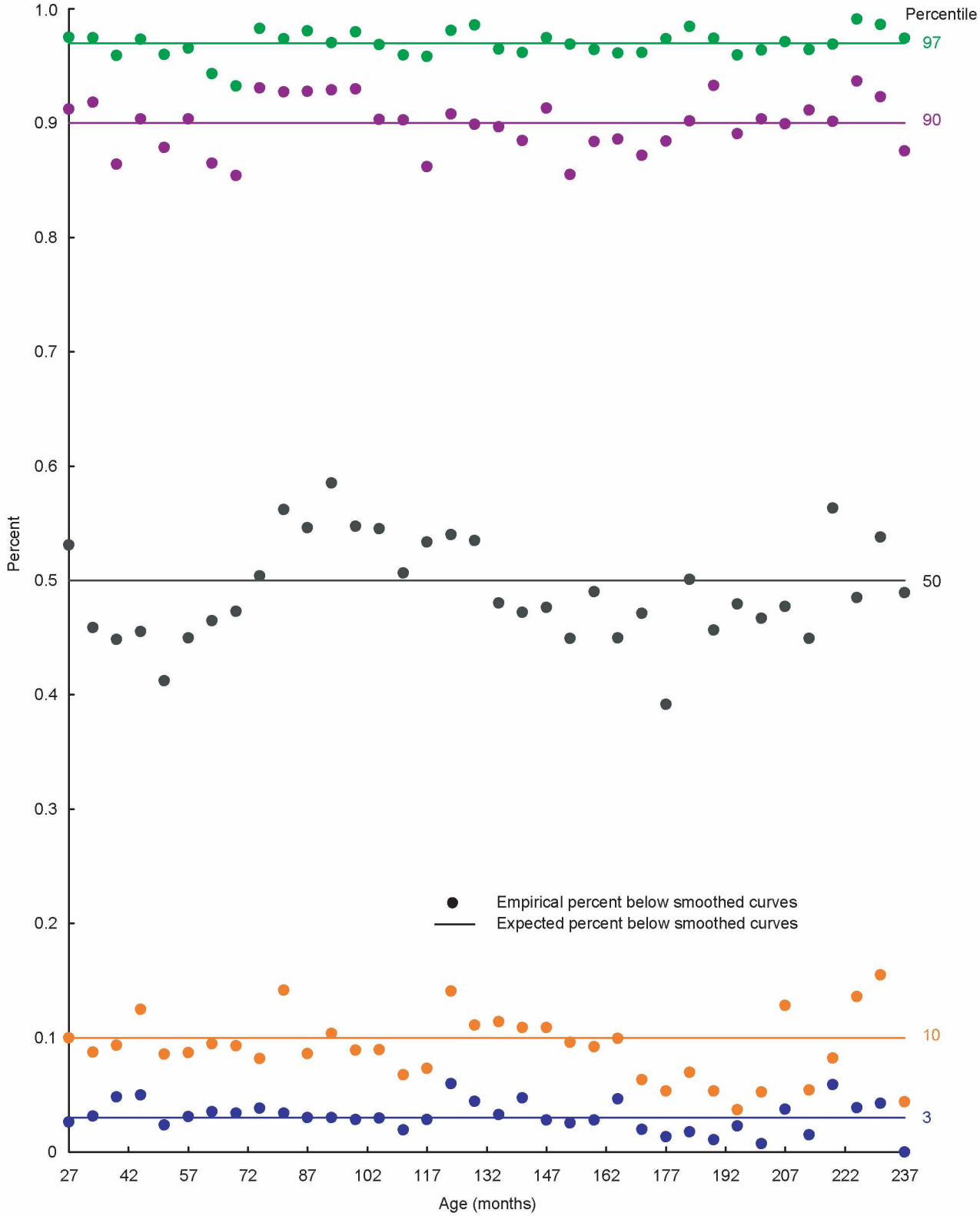


Figure 93. Percent of empirical data below smoothed 3rd, 10th, 50th, 90th, 97th percentile curves, 27–237 months: Girls body mass index-for-age

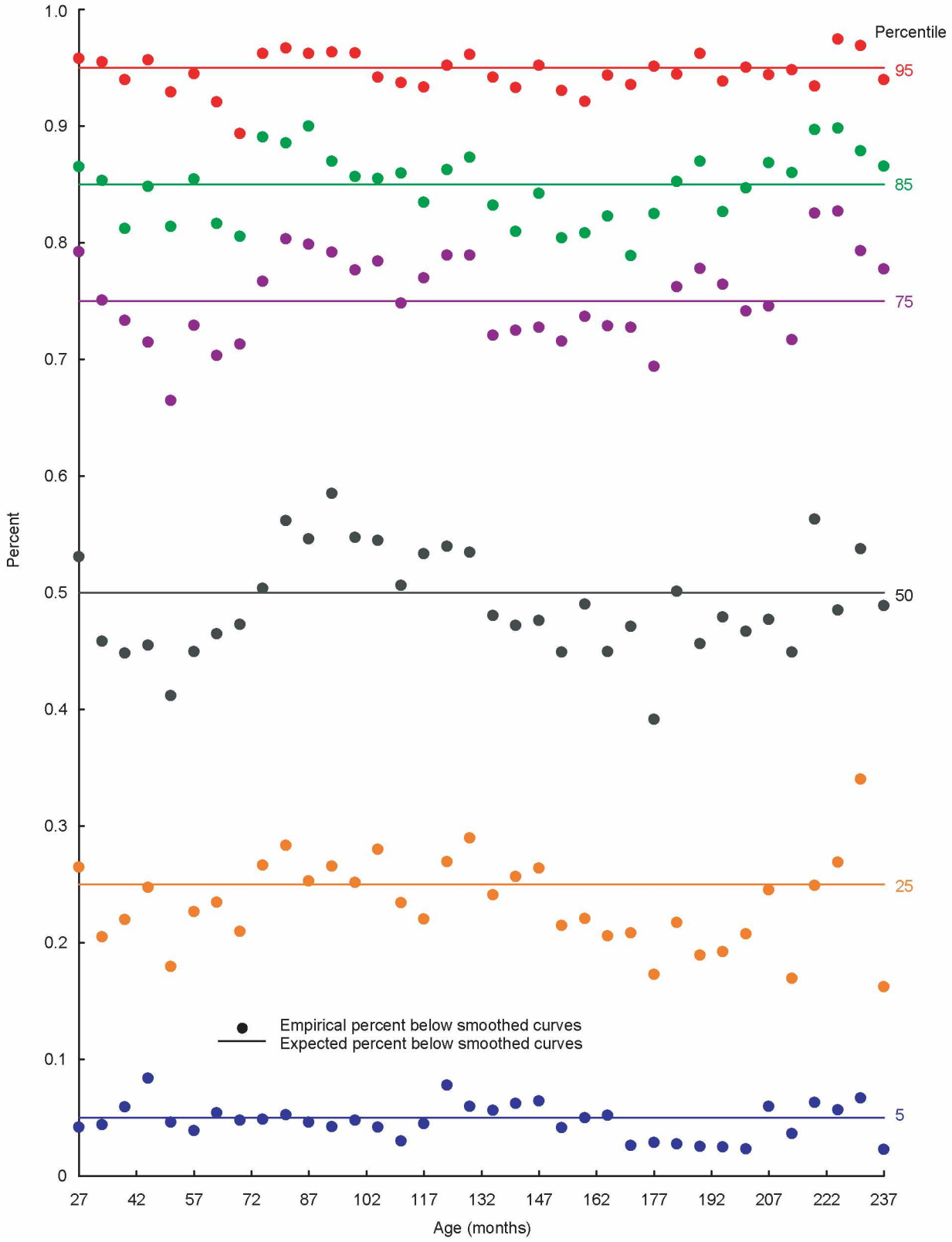


Figure 94. Percent of empirical data below smoothed 5th, 25th, 50th, 75th, 85th, 95th percentile curves, 27–237 months: Girls body mass index-for-age

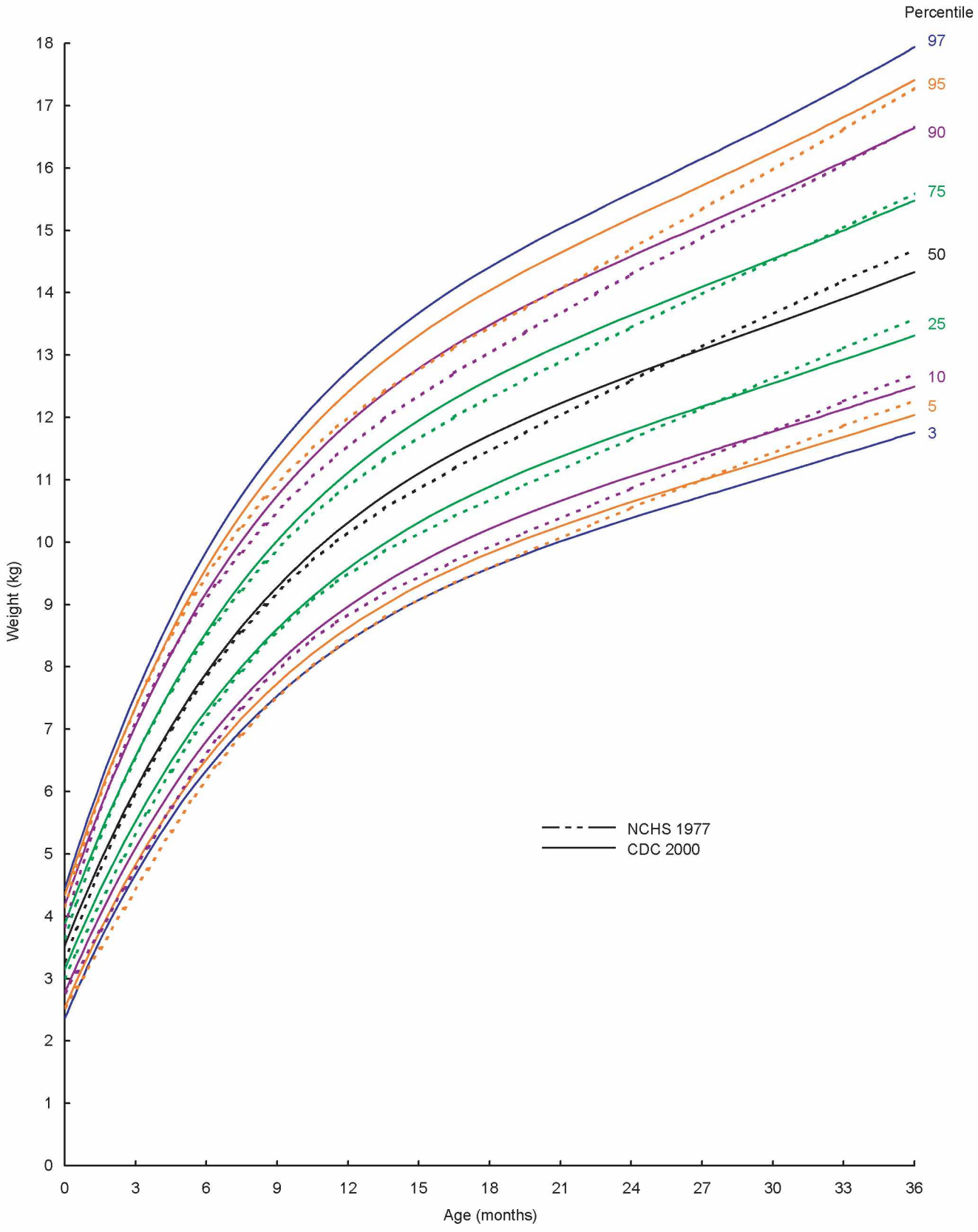


Figure 95. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Boys weight-for-age

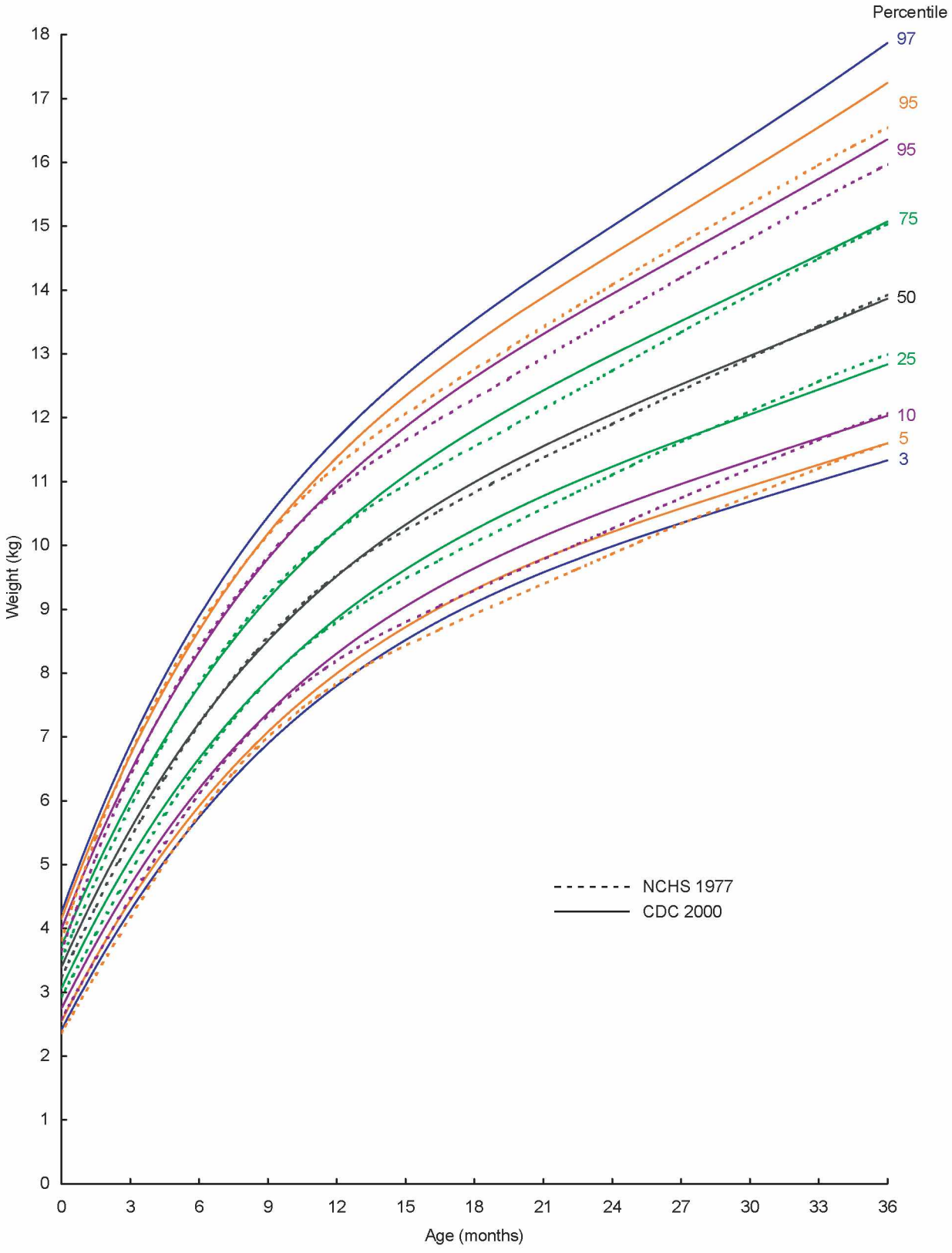


Figure 96. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Girls weight-for-age

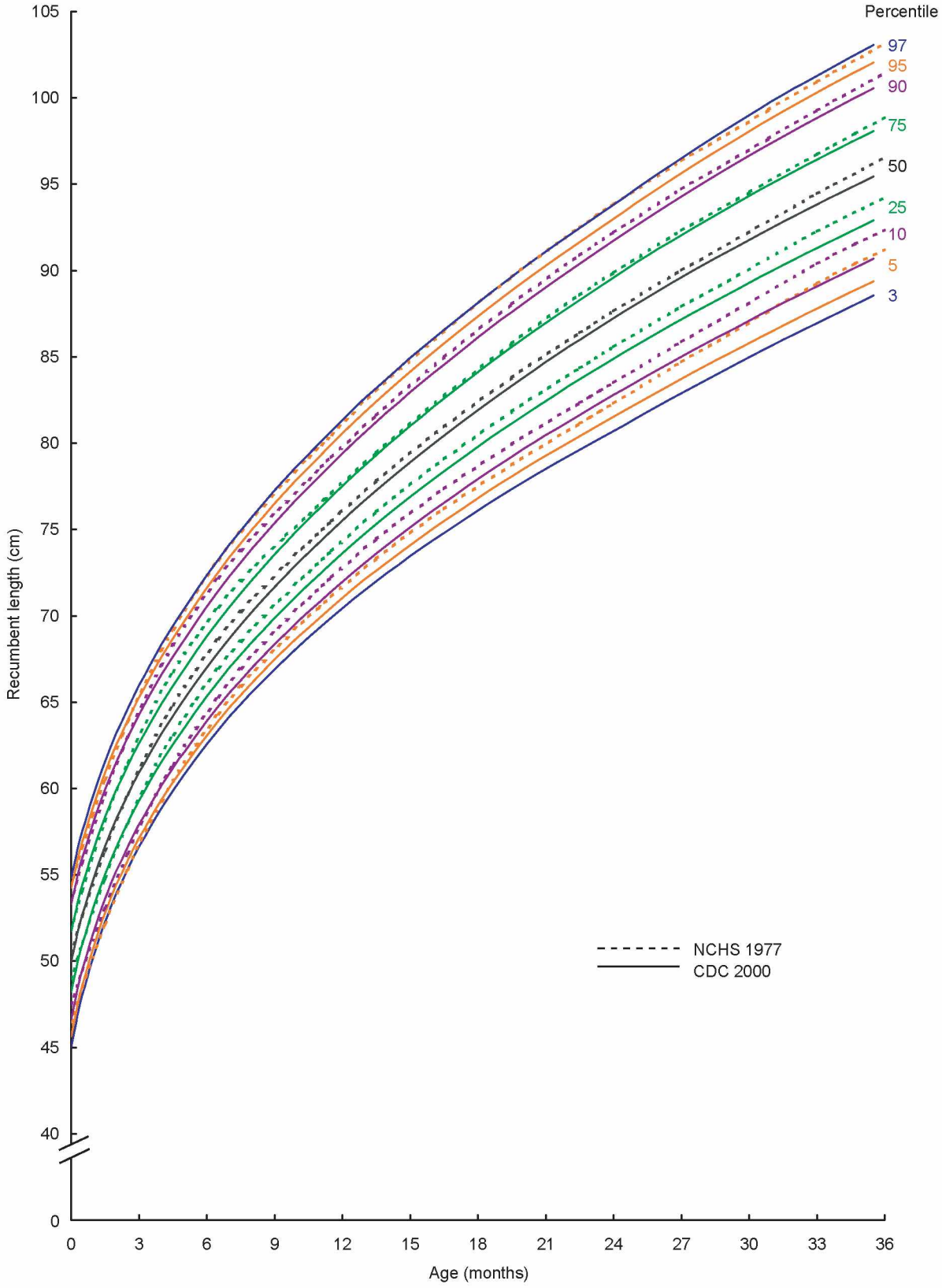


Figure 97. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Boys recumbent length-for-age

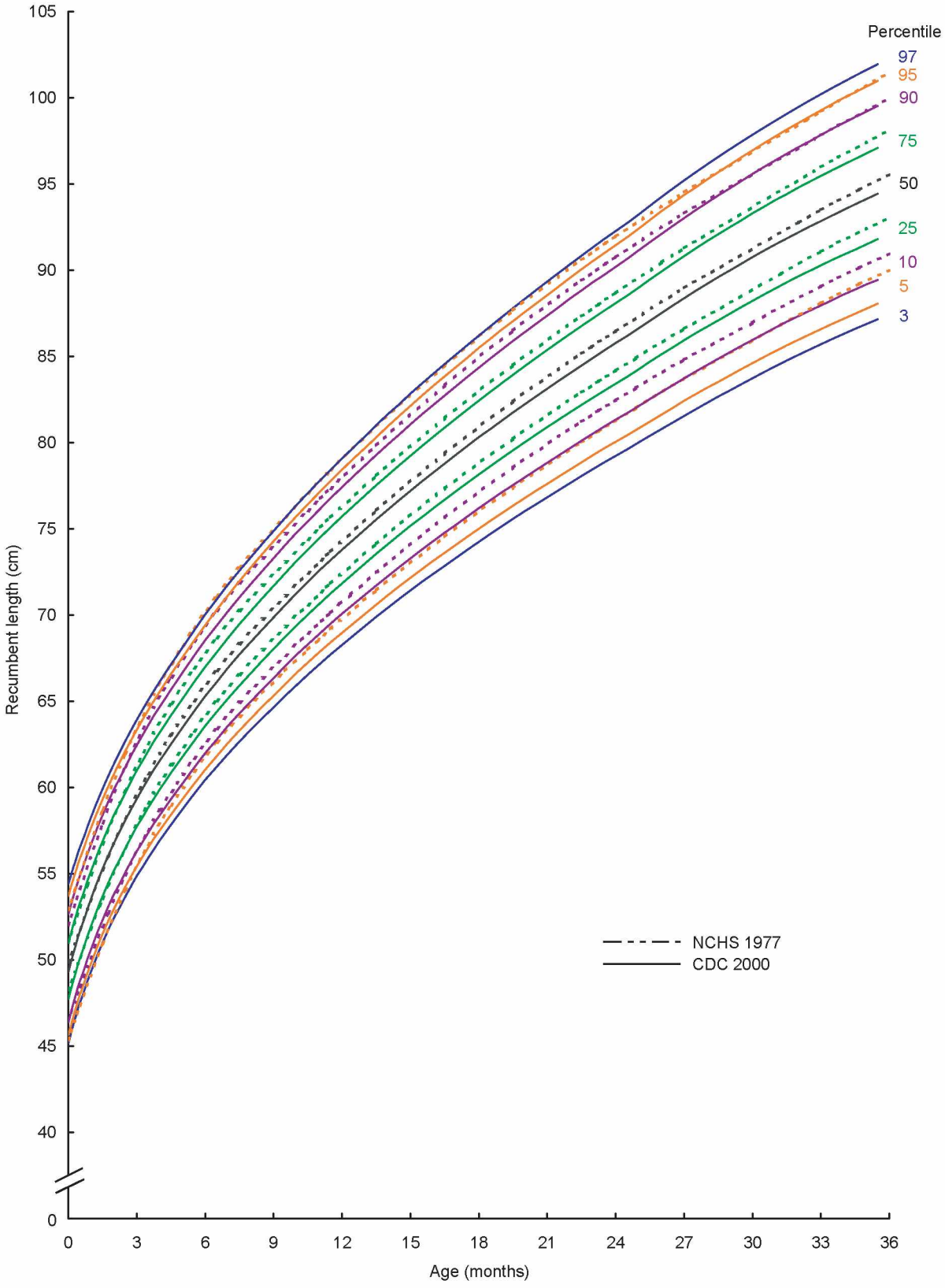


Figure 98. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Girls recumbent length-for-age

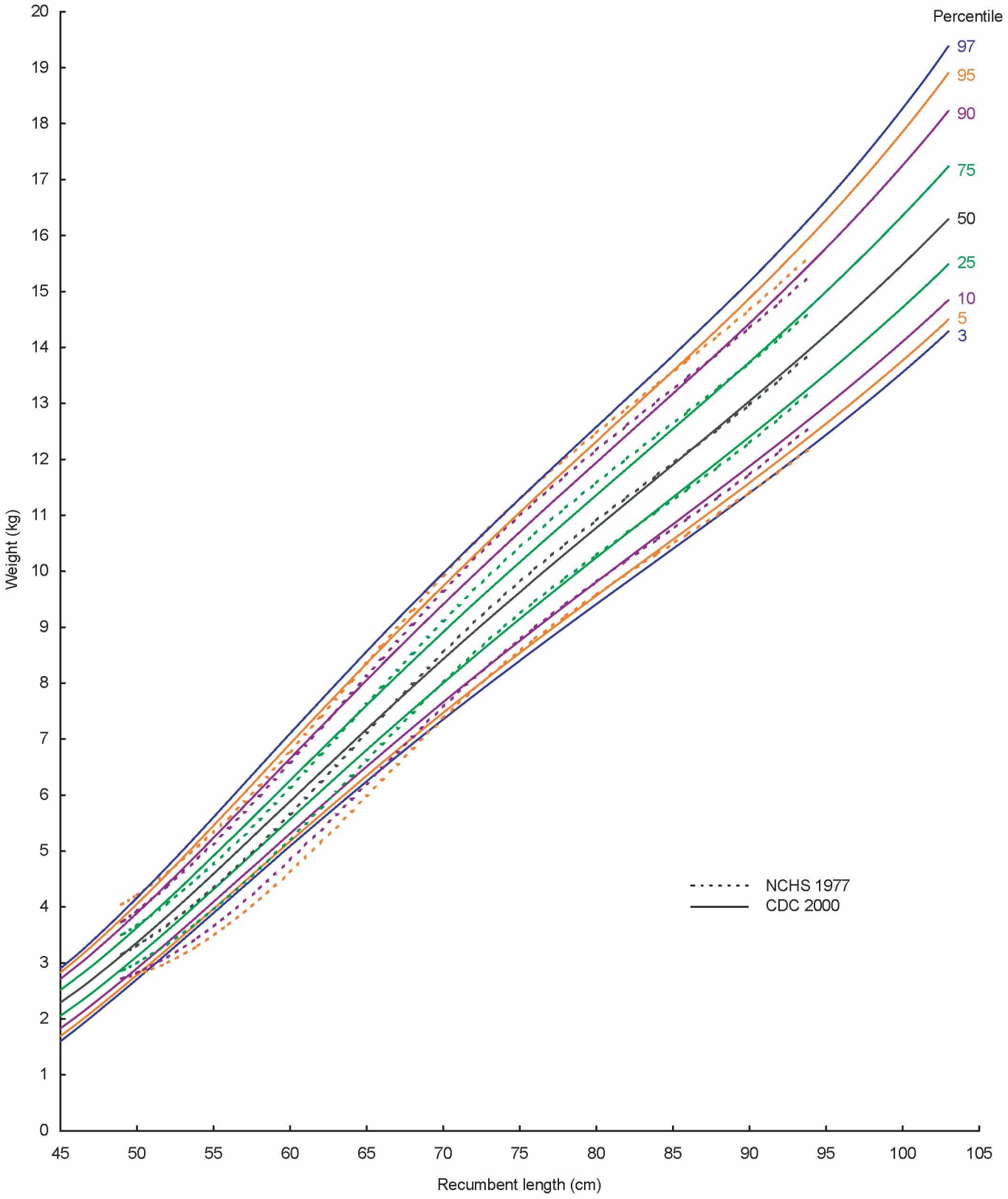


Figure 99. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 49–94 cm: Boys weight-for-length

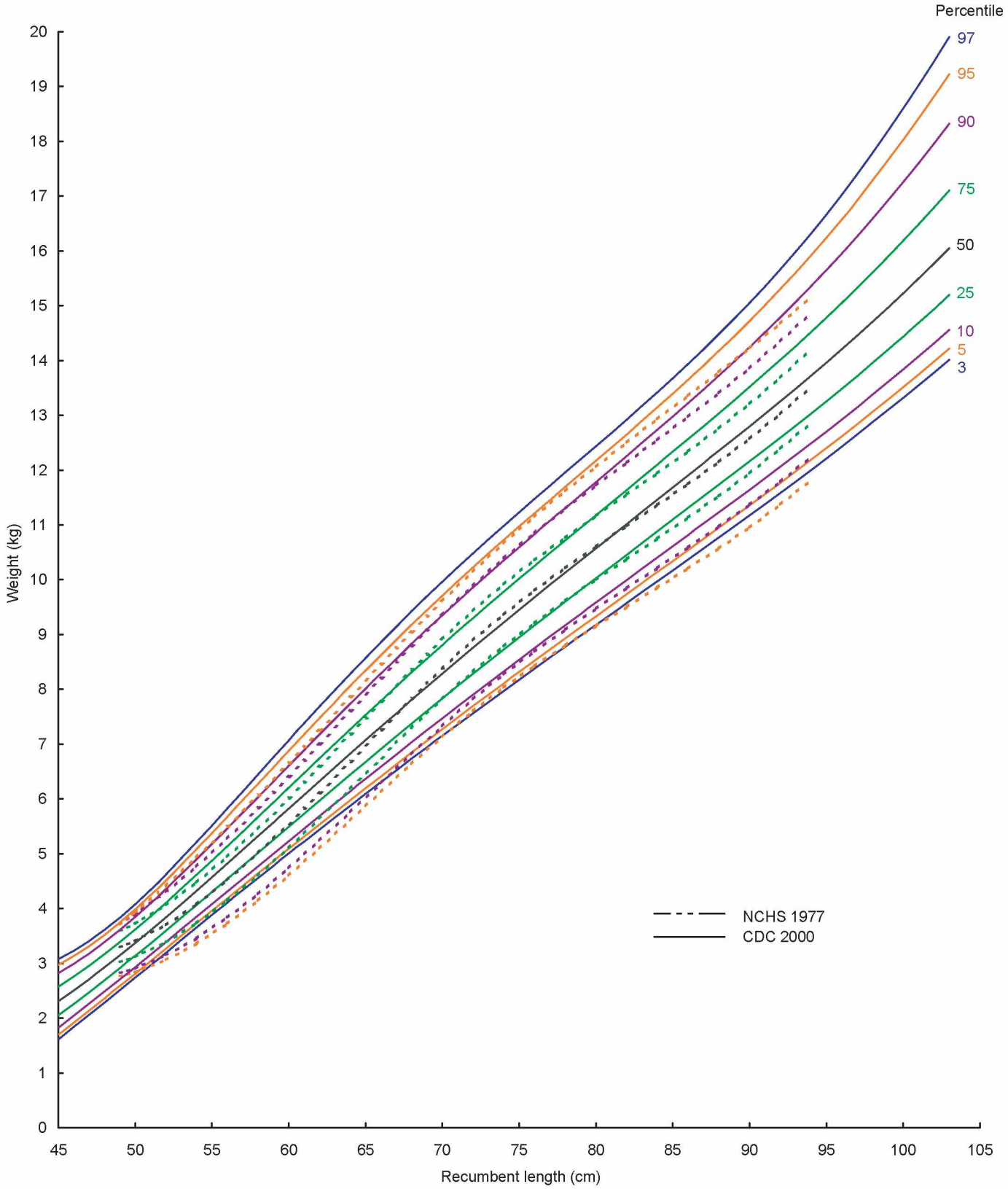


Figure 100. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 49–94 cm: Girls weight-for-length

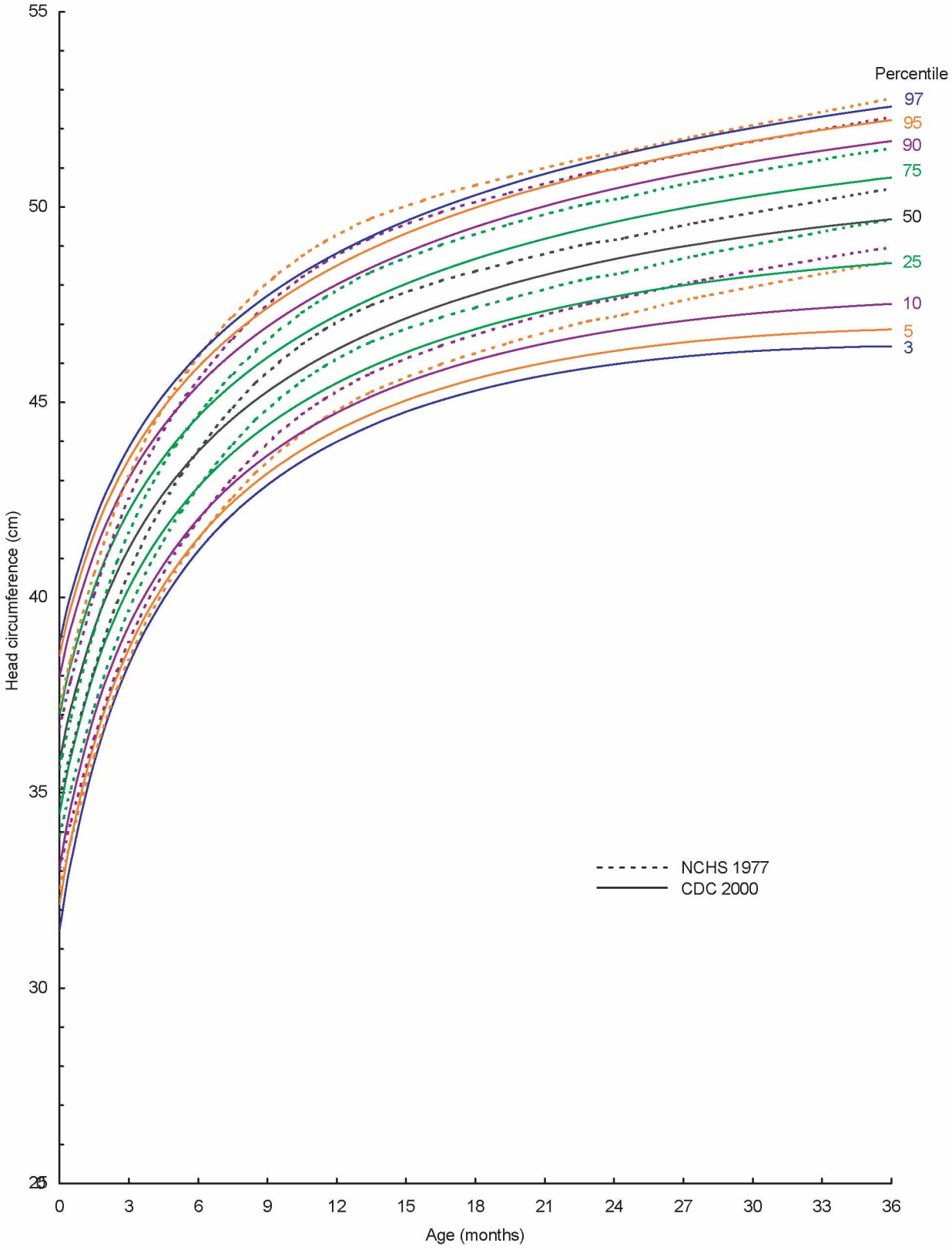


Figure 101. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Boys head circumference-for-age

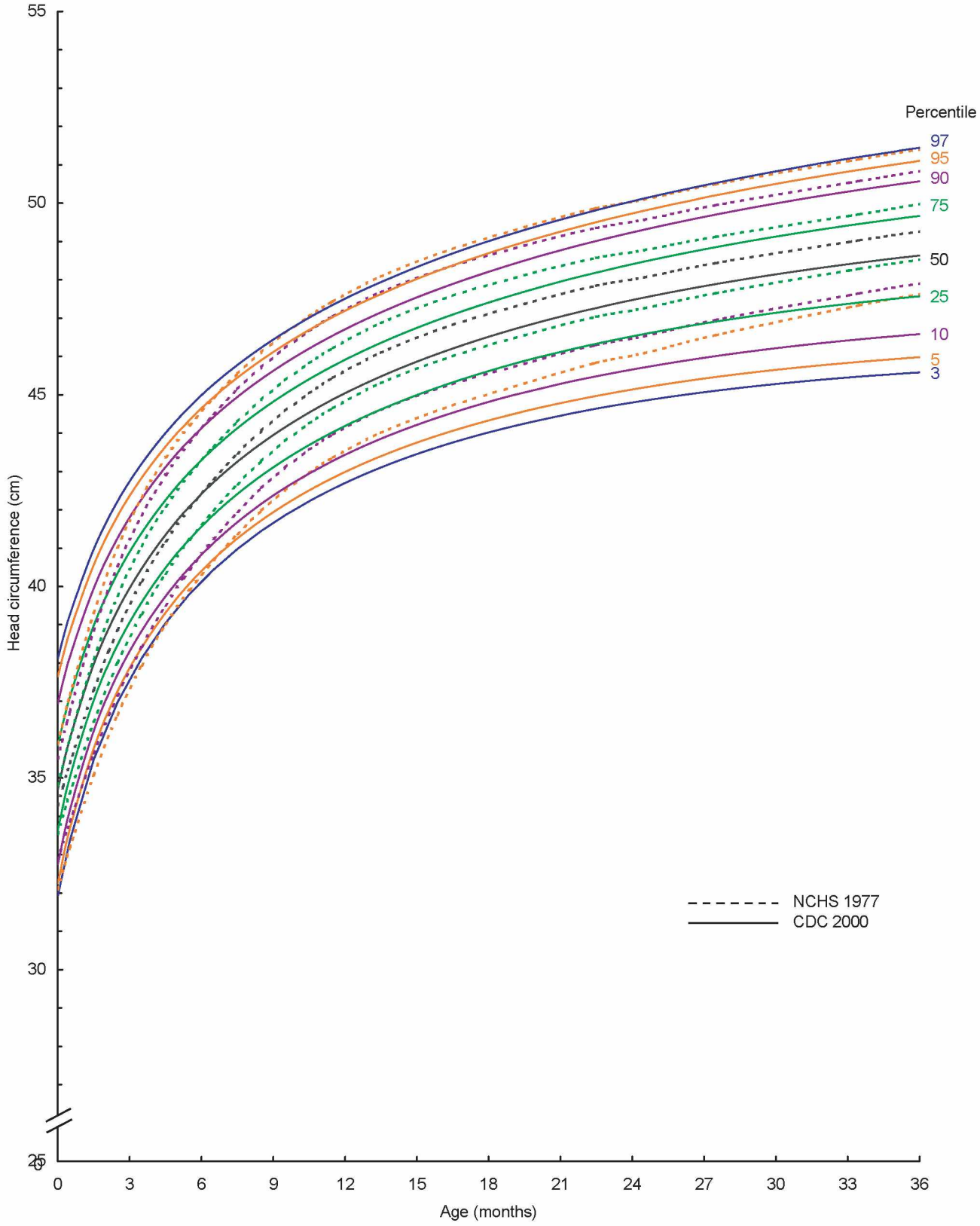


Figure 102. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, birth to 36 months: Girls head circumference-for-age

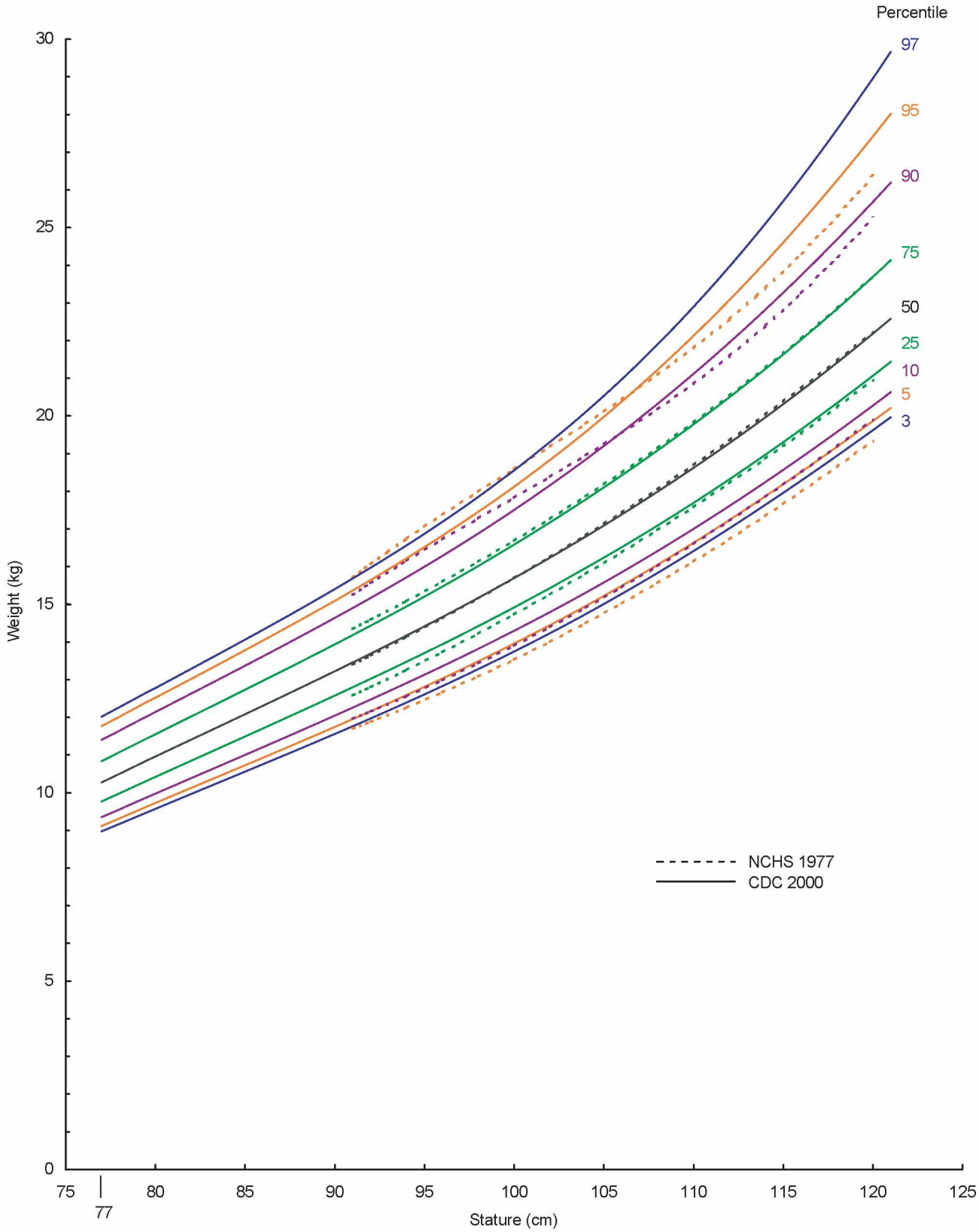


Figure 103. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 91–120 cm: Boys weight-for-stature

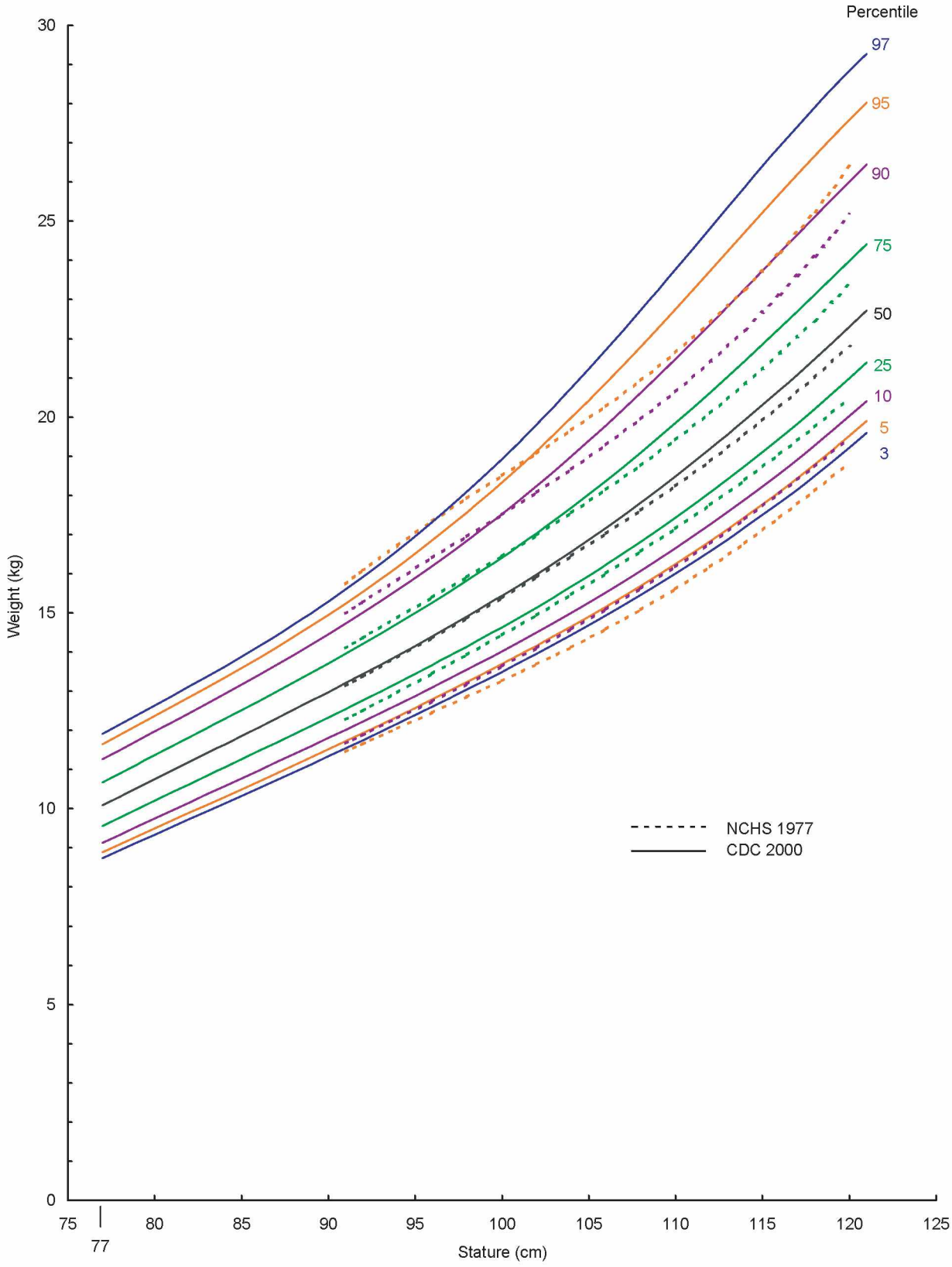


Figure 104. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 91–120 cm: Girls weight-for-stature

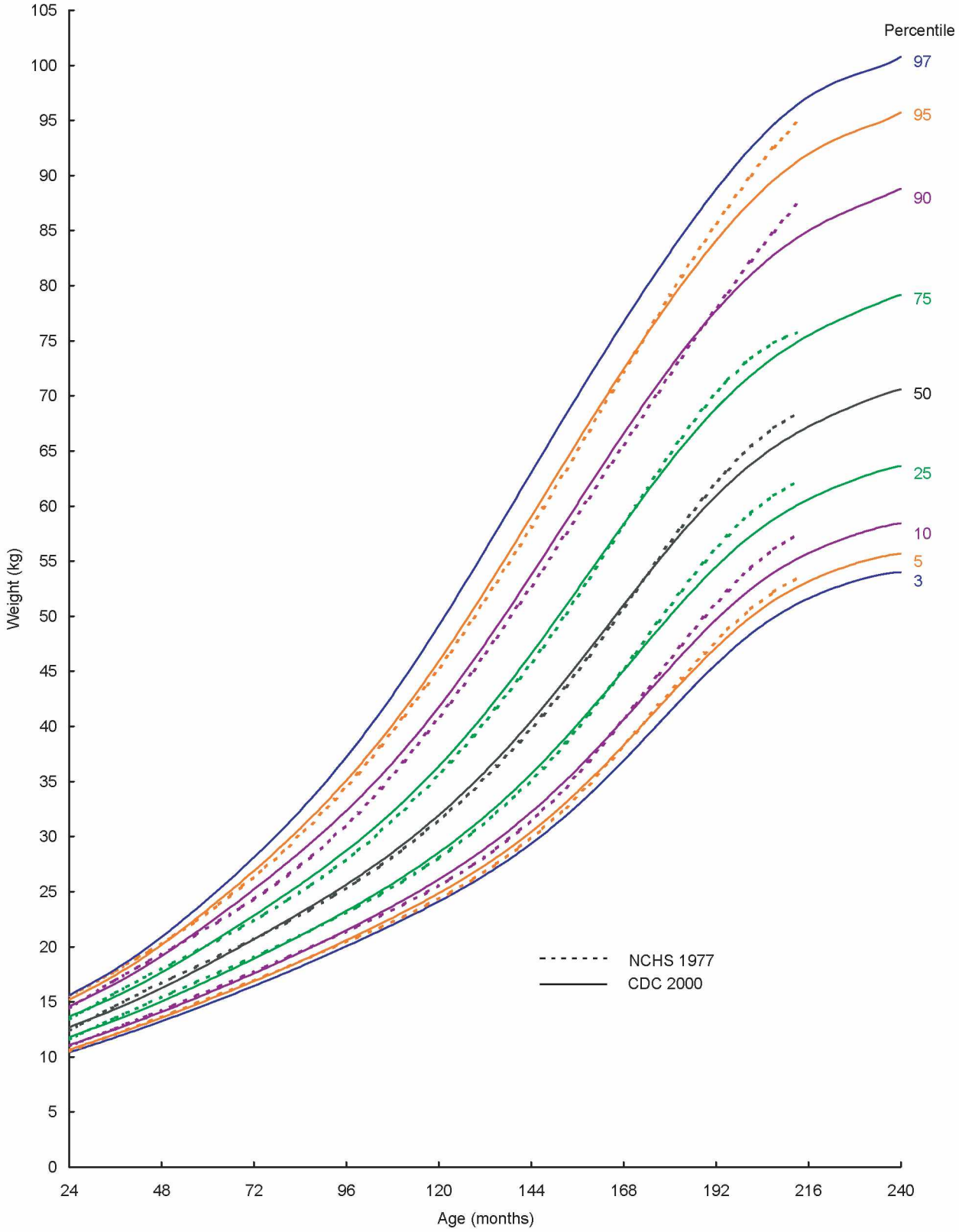


Figure 105. Comparison of revised CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 24–213 months: Boys weight-for-age

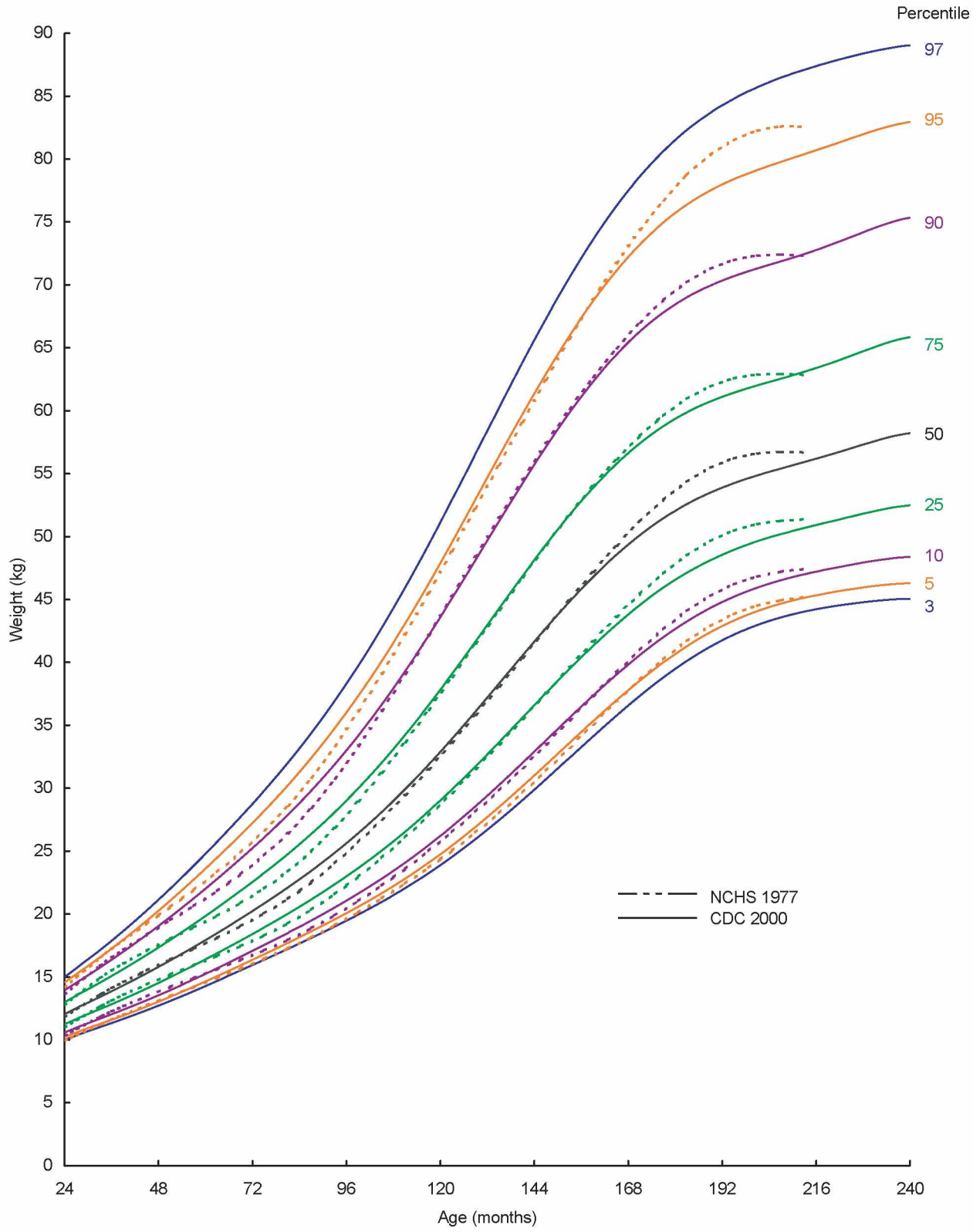


Figure 106. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 24–213 months: Girls weight-for-age

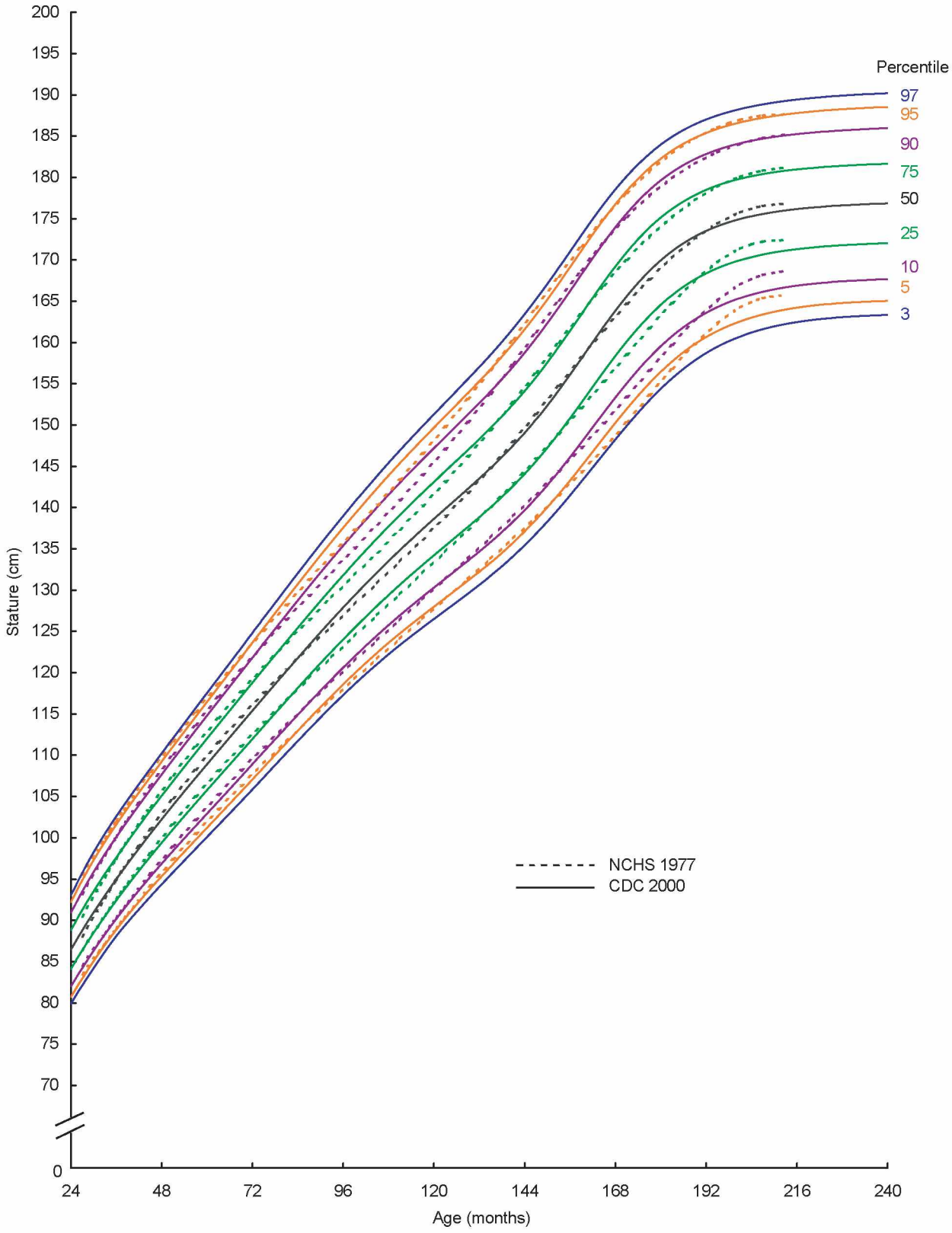


Figure 107. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 24–213 months: Boys stature-for-age

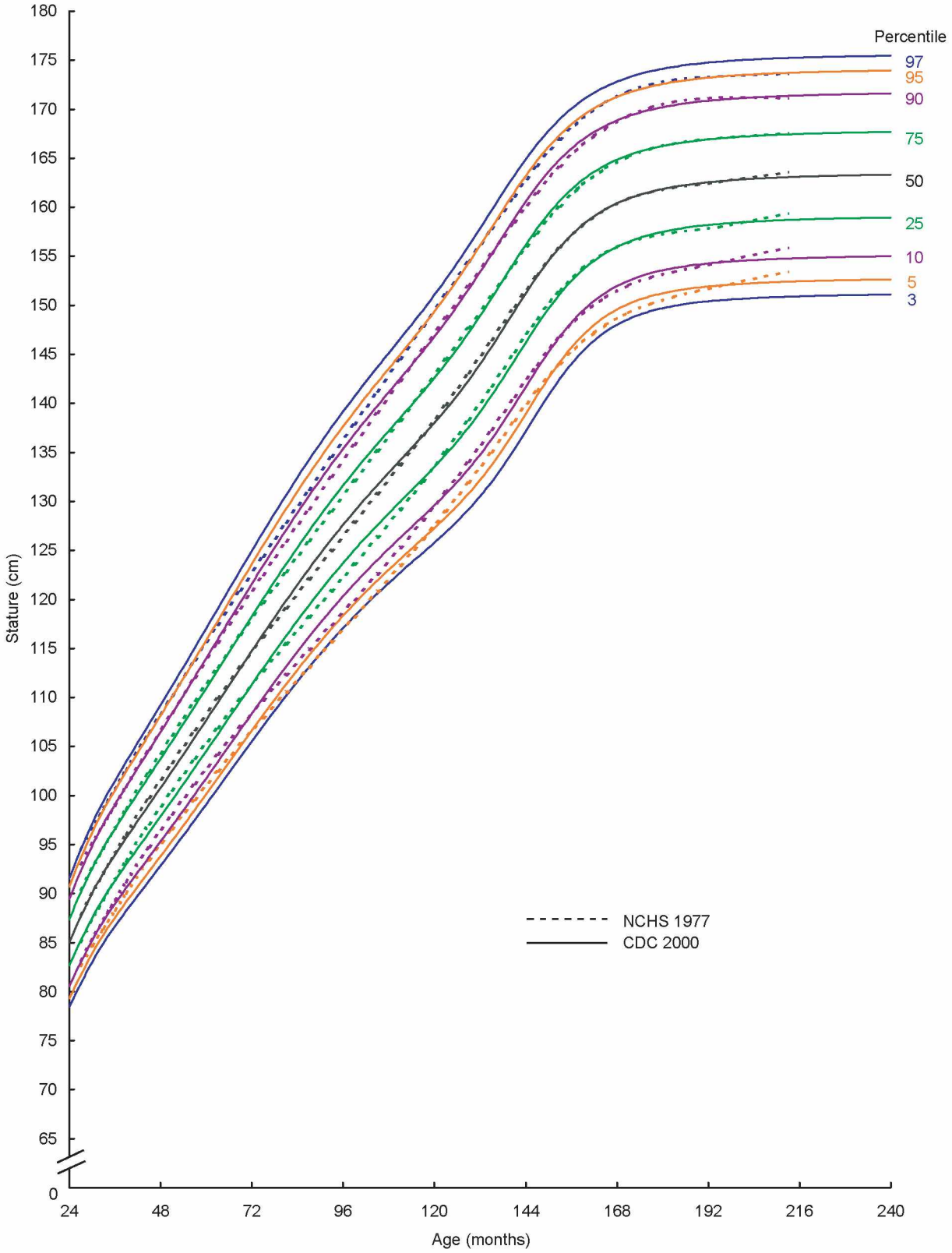


Figure 108. Comparison of CDC 2000 smoothed 3rd, 5th, 10th, 25th, 50th, 75th, 90th, 95th, 97th percentiles with NCHS 1977 smoothed 5th, 10th, 25th, 50th, 75th, 90th, 95th percentile curves, 24–213 months: Girls stature-for-age

Table 1. Unweighted sample sizes for weight-for-age chart by sex, age, and data source: Birth to 36 months

Sex and age	Birth certificates[1]	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Boys					
Total	42,212,378	579	894	2,213	42,216,064
Birth	42,212,378	- - -	- - -	- - -	42,212,378
0–0.99 months	- - -	- - -	- - -	- - -	- - -
1–1.99 months	- - -	- - -	- - -	- - -	- - -
2–2.99 months	- - -	- - -	- - -	38	38
3–3.99 months	- - -	- - -	- - -	89	89
4–4.99 months	- - -	- - -	- - -	104	104
5–5.99 months	- - -	- - -	- - -	95	95
6–6.99 months	- - -	- - -	5	105	110
7–7.99 months	- - -	- - -	24	109	133
8–8.99 months	- - -	- - -	28	107	135
9–9.99 months	- - -	- - -	30	88	118
10–10.99 months	- - -	- - -	33	94	127
11–11.99 months	- - -	- - -	34	92	126
12–14.99 months	- - -	44	91	189	324
15–17.99 months	- - -	73	96	158	327
18–20.99 months	- - -	98	94	149	341
21–23.99 months	- - -	67	91	156	314
24–29.99 months	- - -	164	170	303	637
30–35.99 months	- - -	133	198	337	668
Girls					
Total	40,162,934	538	816	2,170	40,166,458
Birth	40,162,934	- - -	- - -	- - -	40,162,934
0–0.99 months	- - -	- - -	- - -	- - -	- - -
1–1.99 months	- - -	- - -	- - -	- - -	- - -
2–2.99 months	- - -	- - -	- - -	34	34
3–3.99 months	- - -	- - -	- - -	118	118
4–4.99 months	- - -	- - -	- - -	93	93
5–5.99 months	- - -	- - -	- - -	98	98
6–6.99 months	- - -	- - -	9	83	92
7–7.99 months	- - -	- - -	29	93	122
8–8.99 months	- - -	- - -	19	85	104
9–9.99 months	- - -	- - -	29	108	137
10–10.99 months	- - -	- - -	31	95	126
11–11.99 months	- - -	- - -	27	108	135
12–14.99 months	- - -	48	101	155	304
15–17.99 months	- - -	68	83	161	312
18–20.99 months	- - -	80	81	170	331
21–23.99 months	- - -	71	82	157	310
24–29.99 months	- - -	160	162	314	636
30–35.99 months	- - -	111	163	298	572

- - - Data not available.

[1]United States Vital Statistics (1968–80; 1985–94).

[2]National Health and Nutrition Examination Survey.

NOTE: Excludes infants with birthweight less than 1,500 grams.

Table 2. Unweighted sample sizes for recumbent length-for-age chart by sex, age, and data source: Birth to 36 months

Sex and age	NHANES[1] I	NHANES[1] II	NHANES[1] III	PedNSS[2]	Missouri[3]	Wisconsin[4]	Total
Boys							
Total	282	879	2,171	18,624	207,658	237,836	467,412
Birth	---	---	---	---	207,658	237,836	445,494
0–0.99 months	---	---	---	7,559	---	---	7,559
1–1.99 months	---	---	---	4,594	---	---	4,594
2–2.99 months	---	---	---	2,766	---	---	2,766
3–3.99 months	---	---	89	1,551	---	---	1,640
4–4.99 months	---	---	104	2,154	---	---	2,258
5–5.99 months	---	---	96	---	---	---	96
6–6.99 months	---	5	105	---	---	---	110
7–7.99 months	---	24	110	---	---	---	134
8–8.99 months	---	28	107	---	---	---	135
9–9.99 months	---	29	88	---	---	---	117
10–10.99 months	---	32	94	---	---	---	126
11–11.99 months	---	33	92	---	---	---	125
12–14.99 months	44	90	188	---	---	---	322
15–17.99 months	73	95	158	---	---	---	326
18–20.99 months	98	94	149	---	---	---	341
21–23.99 months	67	89	151	---	---	---	307
24–29.99 months	---	166	285	---	---	---	451
30–35.99 months	---	194	317	---	---	---	511
Girls							
Total	267	802	2,131	17,511	196,906	226,728	444,311
Birth	---	---	---	---	196,906	226,728	423,634
0–0.99 months	---	---	---	7,287	---	---	7,287
1–1.99 months	---	---	---	4,231	---	---	4,231
2–2.99 months	---	---	---	2,474	---	---	2,474
3–3.99 months	---	---	118	1,444	---	---	1,562
4–4.99 months	---	---	92	2,075	---	---	2,167
5–5.99 months	---	---	99	---	---	---	99
6–6.99 months	---	9	83	---	---	---	92
7–7.99 months	---	29	93	---	---	---	122
8–8.99 months	---	19	85	---	---	---	104
9–9.99 months	---	28	109	---	---	---	137
10–10.99 months	---	31	95	---	---	---	126
11–11.99 months	---	27	108	---	---	---	135
12–14.99 months	48	100	152	---	---	---	300
15–17.99 months	68	82	160	---	---	---	310
18–20.99 months	80	80	167	---	---	---	327
21–23.99 months	71	82	153	---	---	---	306
24–29.99 months	---	159	294	---	---	---	453
30–35.99 months	---	156	289	---	---	---	445

--- Data not available.

[1]National Health and Nutrition Examination Survey.

[2]Pediatric Nutrition Surveillance System (selected clinics, 1975–95).

[3]State of Missouri Vital Statistics (1989–94).

[4]State of Wisconsin Vital Statistics (1989–94).

NOTE: Excludes infants with birthweight less than 1,500 grams.

Table 3. Unweighted sample sizes for weight-for-recumbent length chart by sex, length interval, and data source: Birth to 36 months

Sex and length interval	NHANES[1] I	NHANES[1] II	NHANES[1] III	Missouri[2]	Wisconsin[3]	Total
Boys						
Total	281	1,284	2,472	136,129	153,960	294,126
45–46.99 centimeters	- - -	- - -	- - -	12,056	7,670	19,726
47–48.99 centimeters	- - -	- - -	- - -	23,159	33,143	56,302
49–50.99 centimeters	- - -	- - -	- - -	64,387	66,343	130,730
51–52.99 centimeters	- - -	- - -	- - -	36,527	46,804	83,331
53–64.99 centimeters	- - -	- - -	- - -	- - -	- - -	- - -
65–66.99 centimeters	- - -	6	105	- - -	- - -	111
67–68.99 centimeters	- - -	15	120	- - -	- - -	135
69–70.99 centimeters	- - -	29	138	- - -	- - -	167
71–72.99 centimeters	2	34	148	- - -	- - -	184
73–74.99 centimeters	8	46	136	- - -	- - -	190
75–76.99 centimeters	17	55	127	- - -	- - -	199
77–78.99 centimeters	30	52	115	- - -	- - -	197
79–80.99 centimeters	45	74	111	- - -	- - -	230
81–82.99 centimeters	52	75	105	- - -	- - -	232
83–84.99 centimeters	43	61	112	- - -	- - -	216
85–86.99 centimeters	31	79	117	- - -	- - -	227
87–88.99 centimeters	30	85	129	- - -	- - -	244
89–90.99 centimeters	15	92	149	- - -	- - -	256
91–92.99 centimeters	4	71	124	- - -	- - -	199
93–94.99 centimeters	1	91	154	- - -	- - -	246
95–96.99 centimeters	2	113	131	- - -	- - -	246
97–98.99 centimeters	1	101	113	- - -	- - -	215
99–100.99 centimeters	- - -	70	115	- - -	- - -	185
101–102.99 centimeters	- - -	59	96	- - -	- - -	155
103–104.99 centimeters	- - -	40	65	- - -	- - -	105
105–106.99 centimeters	- - -	25	45	- - -	- - -	70
107–108.99 centimeters	- - -	11	17	- - -	- - -	28
Girls						
Total	267	1,161	2,404	141,287	170,024	315,143
45–46.99 centimeters	- - -	- - -	- - -	17,214	10,504	27,718
47–48.99 centimeters	- - -	- - -	- - -	23,159	44,491	67,650
49–50.99 centimeters	- - -	- - -	- - -	64,387	73,502	137,889
51–52.99 centimeters	- - -	- - -	- - -	36,527	41,527	78,054
53–64.99 centimeters	- - -	- - -	- - -	- - -	- - -	- - -
65–66.99 centimeters	1	15	115	- - -	- - -	131
67–68.99 centimeters	1	30	138	- - -	- - -	169
69–70.99 centimeters	6	27	114	- - -	- - -	147
71–72.99 centimeters	6	45	142	- - -	- - -	193
73–74.99 centimeters	12	52	133	- - -	- - -	197
75–76.99 centimeters	20	60	95	- - -	- - -	175
77–78.99 centimeters	36	56	101	- - -	- - -	193
79–80.99 centimeters	50	64	108	- - -	- - -	222
81–82.99 centimeters	51	51	93	- - -	- - -	195
83–84.99 centimeters	33	57	113	- - -	- - -	203
85–86.99 centimeters	28	73	135	- - -	- - -	236
87–88.99 centimeters	17	70	151	- - -	- - -	238
89–90.99 centimeters	4	90	131	- - -	- - -	225
91–92.99 centimeters	2	97	116	- - -	- - -	215
93–94.99 centimeters	- - -	79	119	- - -	- - -	198
95–96.99 centimeters	- - -	73	152	- - -	- - -	225
97–98.99 centimeters	- - -	79	125	- - -	- - -	204
99–100.99 centimeters	- - -	55	103	- - -	- - -	158
101–102.99 centimeters	- - -	41	92	- - -	- - -	133
103–104.99 centimeters	- - -	31	63	- - -	- - -	94
105–106.99 centimeters	- - -	11	40	- - -	- - -	51
107–108.99 centimeters	- - -	5	25	- - -	- - -	30

- - - Data not available.

[1]National Health and Nutrition Examination Survey.

[2]State of Missouri Vital Statistics (birth data, 1989–94).

[3]State of Wisconsin Vital Statistics (birth data, 1989–94).

NOTE: Excludes infants with birthweight less than 1,500 grams.

Table 4. Unweighted sample sizes for head circumference-for-age chart by sex, age, and data source: Birth to 36 months

Sex and age	NHANES[1] I	NHANES[1] II	NHANES[1] III	Fels[2]	Total
Boys					
Total	579	880	2,156	188	3,803
Birth	- - -	- - -	- - -	188	188
0–0.99 months	- - -	- - -	- - -	- - -	- - -
1–1.99 months	- - -	- - -	- - -	- - -	- - -
2–2.99 months	- - -	- - -	38	- - -	38
3–3.99 months	- - -	- - -	89	- - -	89
4–4.99 months	- - -	- - -	104	- - -	104
5–5.99 months	- - -	- - -	96	- - -	96
6–6.99 months	- - -	5	104	- - -	109
7–7.99 months	- - -	24	107	- - -	131
8–8.99 months	- - -	27	107	- - -	134
9–9.99 months	- - -	28	88	- - -	116
10–10.99 months	- - -	32	94	- - -	126
11–11.99 months	- - -	33	90	- - -	123
12–14.99 months	44	88	189	- - -	321
15–17.99 months	73	95	156	- - -	324
18–20.99 months	98	93	149	- - -	340
21–23.99 months	67	89	151	- - -	307
24–29.99 months	164	169	277	- - -	610
30–35.99 months	133	197	317	- - -	647
Girls					
Total	538	809	2,108	174	3,629
Birth	- - -	- - -	- - -	174	174
0–0.99 months	- - -	- - -	- - -	- - -	- - -
1–1.99 months	- - -	- - -	- - -	- - -	- - -
2–2.99 months	- - -	- - -	33	- - -	33
3–3.99 months	- - -	- - -	117	- - -	117
4–4.99 months	- - -	- - -	92	- - -	92
5–5.99 months	- - -	- - -	98	- - -	98
6–6.99 months	- - -	9	82	- - -	91
7–7.99 months	- - -	29	93	- - -	122
8–8.99 months	- - -	18	85	- - -	103
9–9.99 months	- - -	29	110	- - -	139
10–10.99 months	- - -	31	94	- - -	125
11–11.99 months	- - -	26	107	- - -	133
12–14.99 months	48	101	150	- - -	299
15–17.99 months	68	81	157	- - -	306
18–20.99 months	80	81	166	- - -	327
21–23.99 months	71	82	154	- - -	307
24–29.99 months	160	160	292	- - -	612
30–35.99 months	111	162	278	- - -	551

- - - Data not available.

[1]National Health and Nutrition Examination Survey.

[2]Fels Longitudinal Growth Study (1960–94).

NOTE: Excludes infants with birthweight less than 1,500 grams.

Table 5. Unweighted sample sizes for weight-for-stature chart by sex, stature interval, and data source: 77 to 121 cm

Sex and stature interval	NHANES[1] I	NHANES[1] II	NHANES[1] III	Total
Boys				
Total	1,337	1,686	2,104	5,127
77–78.99 centimeters	- - -	1	- - -	1
79–80.99 centimeters	2	1	5	8
81–82.99 centimeters	7	7	5	19
83–84.99 centimeters	8	17	32	57
85–86.99 centimeters	27	45	51	123
87–88.99 centimeters	56	52	104	212
89–90.99 centimeters	67	71	115	253
91–92.99 centimeters	63	77	136	276
93–94.99 centimeters	80	101	147	328
95–96.99 centimeters	84	129	152	365
97–98.99 centimeters	91	109	116	316
99–100.99 centimeters	74	111	141	326
101–102.99 centimeters	88	114	150	352
103–104.99 centimeters	91	113	158	362
105–106.99 centimeters	87	109	170	366
107–108.99 centimeters	88	114	136	338
109–110.99 centimeters	72	122	120	314
111–112.99 centimeters	77	109	133	319
113–114.99 centimeters	85	94	104	283
115–116.99 centimeters	66	65	55	186
117–118.99 centimeters	66	60	42	168
119–120.99 centimeters	58	65	32	155
Girls				
Total	1,327	1,589	2,187	5,103
77–78.99 centimeters	1	- - -	3	4
79–80.99 centimeters	5	4	4	13
81–82.99 centimeters	12	9	19	40
83–84.99 centimeters	19	24	55	98
85–86.99 centimeters	45	57	69	171
87–88.99 centimeters	45	57	115	217
89–90.99 centimeters	48	87	109	244
91–92.99 centimeters	60	94	130	284
93–94.99 centimeters	88	87	136	311
95–96.99 centimeters	78	88	141	307
97–98.99 centimeters	89	103	154	346
99–100.99 centimeters	93	93	150	336
101–102.99 centimeters	71	98	143	312
103–104.99 centimeters	72	124	181	377
105–106.99 centimeters	81	99	158	338
107–108.99 centimeters	79	95	151	325
109–110.99 centimeters	73	118	121	312
111–112.99 centimeters	86	91	110	287
113–114.99 centimeters	81	77	95	253
115–116.99 centimeters	72	60	59	191
117–118.99 centimeters	66	63	49	178
119–120.99 centimeters	63	61	35	159

- - - Data not available.

[1]National Health and Nutrition Examination Survey.

Table 6. Unweighted sample sizes for weight-for-age chart by sex, age, and data source: 2 to 20 years

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Boys						
Total	3,632	3,545	3,533	3,838	2,207	16,755
2–2.49 years	---	---	165	171	305	641
2.5–2.99 years	---	---	133	199	340	672
3.0–3.49 years	---	---	162	209	275	646
3.5–3.99 years	---	---	146	212	241	599
4.0–4.49 years	---	---	148	198	276	622
4.5–4.99 years	---	---	156	207	273	636
5.0–5.49 years	---	---	126	182	277	585
5.5–5.99 years	---	---	147	211	220	578
6.0–6.49 years	294	---	102	75	---	471
6.5–6.99 years	281	---	77	71	---	429
7.0–7.49 years	319	---	84	74	---	477
7.5–7.99 years	313	---	80	76	---	469
8.0–8.49 years	296	---	86	76	---	458
8.5–8.99 years	322	---	66	69	---	457
9.0–9.49 years	283	---	91	72	---	446
9.5–9.99 years	320	---	78	69	---	467
10.0–10.49 years	281	---	94	96	---	471
10.5–10.99 years	295	---	90	69	---	454
11.0–11.49 years	302	---	99	77	---	478
11.5–11.99 years	293	---	79	76	---	448
12.0–12.49 years	33	287	86	74	---	480
12.5–12.99 years	---	356	114	73	---	543
13.0–13.49 years	---	327	86	83	---	496
13.5–13.99 years	---	299	88	82	---	469
14.0–14.49 years	---	305	89	88	---	482
14.5–14.99 years	---	313	85	100	---	498
15.0–15.49 years	---	321	85	93	---	499
15.5–15.99 years	---	292	86	87	---	465
16.0–16.49 years	---	295	88	89	---	472
16.5–16.99 years	---	261	81	91	---	433
17.0–17.49 years	---	242	85	98	---	425
17.5–17.99 years	---	216	91	85	---	392
18.0–18.49 years	---	31	69	80	---	180
18.5–18.99 years	---	---	55	76	---	131
19.0–19.49 years	---	---	68	79	---	147
19.5–19.99 years	---	---	68	71	---	139
Girls						
Total	3,487	3,223	3,532	3,572	2,302	16,116
2–2.49 years	---	---	161	164	320	645
2.5–2.99 years	---	---	111	166	304	581
3.0–3.49 years	---	---	145	185	288	618
3.5–3.99 years	---	---	147	182	299	628
4.0–4.49 years	---	---	131	200	291	622
4.5–4.99 years	---	---	150	188	246	584
5.0–5.49 years	---	---	143	196	259	598
5.5–5.99 years	---	---	171	173	295	639
6.0–6.49 years	251	---	81	82	---	414
6.5–6.99 years	285	---	95	68	---	448
7.0–7.49 years	313	---	77	74	---	464
7.5–7.99 years	296	---	92	80	---	468
8.0–8.49 years	314	---	86	70	---	470
8.5–8.99 years	299	---	66	55	---	420
9.0–9.49 years	303	---	85	72	---	460
9.5–9.99 years	278	---	86	82	---	446
10.0–10.49 years	304	---	107	68	---	479
10.5–10.99 years	280	---	90	60	---	430
11.0–11.49 years	265	---	81	76	---	422
11.5–11.99 years	260	---	85	67	---	412
12.0–12.49 years	39	257	90	71	---	457
12.5–12.99 years	---	290	87	75	---	452
13.0–13.49 years	---	310	94	71	---	475
13.5–13.99 years	---	272	104	84	---	460
14.0–14.49 years	---	306	95	92	---	493
14.5–14.99 years	---	280	89	89	---	458

Table 6. Unweighted sample sizes for weight-for-age chart by sex, age, and data source: 2 to 20 years—Con.

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Girls—Con.						
15.0–15.49 years	- - -	241	93	79	- - -	413
15.5–15.99 years	- - -	262	78	68	- - -	408
16.0–16.49 years	- - -	271	67	90	- - -	428
16.5–16.99 years	- - -	265	108	81	- - -	454
17.0–17.49 years	- - -	231	80	71	- - -	382
17.5–17.99 years	- - -	211	77	65	- - -	353
18.0–18.49 years	- - -	27	80	80	- - -	187
18.5–18.99 years	- - -	- - -	64	84	- - -	148
19.0–19.49 years	- - -	- - -	75	86	- - -	161
19.5–19.99 years	- - -	- - -	61	78	- - -	139

- - - Data not available.

[1]National Health Examination Survey.

[2]National Health and Nutrition Examination Survey.

Table 7. Unweighted sample sizes for stature-for-age chart by sex, age, and data source: 2 to 20 years

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Boys						
Total	3,632	3,545	3,533	3,808	5,336	19,854
2–2.49 years	---	---	165	148	254	567
2.5–2.99 years	---	---	133	196	326	655
3.0–3.49 years	---	---	162	208	272	642
3.5–3.99 years	---	---	146	209	238	593
4.0–4.49 years	---	---	148	198	279	625
4.5–4.99 years	---	---	156	207	272	635
5.0–5.49 years	---	---	126	182	276	584
5.5–5.99 years	---	---	147	211	221	579
6.0–6.49 years	294	---	102	75	159	630
6.5–6.99 years	281	---	77	71	124	553
7.0–7.49 years	319	---	84	74	139	616
7.5–7.99 years	313	---	80	76	131	600
8.0–8.49 years	296	---	86	76	136	594
8.5–8.99 years	322	---	66	69	133	590
9.0–9.49 years	283	---	91	72	131	577
9.5–9.99 years	320	---	78	69	149	616
10.0–10.49 years	281	---	94	96	152	623
10.5–10.99 years	295	---	90	69	145	599
11.0–11.49 years	302	---	99	77	134	612
11.5–11.99 years	293	---	79	76	151	599
12.0–12.49 years	33	287	86	74	93	573
12.5–12.99 years	---	356	114	73	114	657
13.0–13.49 years	---	327	86	83	103	599
13.5–13.99 years	---	299	88	82	87	556
14.0–14.49 years	---	305	89	88	100	582
14.5–14.99 years	---	313	85	100	91	589
15.0–15.49 years	---	321	85	93	106	605
15.5–15.99 years	---	292	86	87	82	547
16.0–16.49 years	---	295	88	89	103	575
16.5–16.99 years	---	261	81	91	94	527
17.0–17.49 years	---	242	85	98	103	528
17.5–17.99 years	---	216	91	85	93	485
18.0–18.49 years	---	31	69	80	90	270
18.5–18.99 years	---	---	55	76	86	217
19.0–19.49 years	---	---	68	79	87	234
19.5–19.99 years	---	---	68	71	82	221
Girls						
Total	3,487	3,223	3,532	3,545	5,564	19,351
2–2.49 years	---	---	161	146	264	571
2.5–2.99 years	---	---	111	161	297	569
3.0–3.49 years	---	---	145	183	284	612
3.5–3.99 years	---	---	147	181	296	624
4.0–4.49 years	---	---	131	199	289	619
4.5–4.99 years	---	---	150	188	246	584
5.0–5.49 years	---	---	143	196	260	599
5.5–5.99 years	---	---	171	173	297	641
6.0–6.49 years	251	---	81	82	132	546
6.5–6.99 years	285	---	95	68	142	590
7.0–7.49 years	313	---	77	74	150	614
7.5–7.99 years	296	---	92	80	125	593
8.0–8.49 years	314	---	86	70	117	587
8.5–8.99 years	299	---	66	55	130	550
9.0–9.49 years	303	---	85	72	154	614
9.5–9.99 years	278	---	86	82	128	574
10.0–10.49 years	304	---	107	68	134	613
10.5–10.99 years	280	---	90	60	128	558
11.0–11.49 years	265	---	81	76	143	565
11.5–11.99 years	260	---	85	67	132	544
12.0–12.49 years	39	257	90	71	119	576
12.5–12.99 years	---	290	87	75	120	572
13.0–13.49 years	---	310	94	71	104	579
13.5–13.99 years	---	272	104	84	121	581
14.0–14.49 years	---	306	95	92	111	604
14.5–14.99 years	---	280	89	89	115	573

Table 7. Unweighted sample sizes for stature-for-age chart by sex, age, and data source: 2 to 20 years—Con.

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Girls—Con.						
15.0–15.49 years	- - -	241	93	79	83	496
15.5–15.99 years	- - -	262	78	68	118	526
16.0–16.49 years	- - -	271	67	90	104	532
16.5–16.99 years	- - -	265	108	81	117	571
17.0–17.49 years	- - -	231	80	71	104	486
17.5–17.99 years	- - -	211	77	65	113	466
18.0–18.49 years	- - -	27	80	80	108	295
18.5–18.99 years	- - -	- - -	64	84	85	233
19.0–19.49 years	- - -	- - -	75	86	86	247
19.5–19.99 years	- - -	- - -	61	78	108	247

- - - Data not available.

[1]National Health Examination Survey.

[2]National Health and Nutrition Examination Survey.

Table 8. Unweighted sample sizes for body mass index (BMI)-for-age chart by sex, age, and data source: 2 to 20 years

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Boys						
Total	3,632	3,545	3,533	3,808	2,130	16,648
2–2.49 years	---	---	165	148	254	567
2.5–2.99 years	---	---	133	196	325	654
3.0–3.49 years	---	---	162	208	271	641
3.5–3.99 years	---	---	146	209	238	593
4.0–4.49 years	---	---	148	198	276	622
4.5–4.99 years	---	---	156	207	271	634
5.0–5.49 years	---	---	126	182	275	583
5.5–5.99 years	---	---	147	211	220	578
6.0–6.49 years	294	---	102	75	---	471
6.5–6.99 years	281	---	77	71	---	429
7.0–7.49 years	319	---	84	74	---	477
7.5–7.99 years	313	---	80	76	---	469
8.0–8.49 years	296	---	86	76	---	458
8.5–8.99 years	322	---	66	69	---	457
9.0–9.49 years	283	---	91	72	---	446
9.5–9.99 years	320	---	78	69	---	467
10.0–10.49 years	281	---	94	96	---	471
10.5–10.99 years	295	---	90	69	---	454
11.0–11.49 years	302	---	99	77	---	478
11.5–11.99 years	293	---	79	76	---	448
12.0–12.49 years	33	287	86	74	---	480
12.5–12.99 years	---	356	114	73	---	543
13.0–13.49 years	---	327	86	83	---	496
13.5–13.99 years	---	299	88	82	---	469
14.0–14.49 years	---	305	89	88	---	482
14.5–14.99 years	---	313	85	100	---	498
15.0–15.49 years	---	321	85	93	---	499
15.5–15.99 years	---	292	86	87	---	465
16.0–16.49 years	---	295	88	89	---	472
16.5–16.99 years	---	261	81	91	---	433
17.0–17.49 years	---	242	85	98	---	425
17.5–17.99 years	---	216	91	85	---	392
18.0–18.49 years	---	31	69	80	---	180
18.5–18.99 years	---	---	55	76	---	131
19.0–19.49 years	---	---	68	79	---	147
19.5–19.99 years	---	---	68	71	---	139
Girls						
Total	3,487	3,223	3,532	3,545	2,218	16,005
2–2.49 years	---	---	161	146	263	570
2.5–2.99 years	---	---	111	161	296	568
3.0–3.49 years	---	---	145	183	278	606
3.5–3.99 years	---	---	147	181	294	622
4.0–4.49 years	---	---	131	199	287	617
4.5–4.99 years	---	---	150	188	246	584
5.0–5.49 years	---	---	143	196	259	598
5.5–5.99 years	---	---	171	173	295	639
6.0–6.49 years	251	---	81	82	---	414
6.5–6.99 years	285	---	95	68	---	448
7.0–7.49 years	313	---	77	74	---	464
7.5–7.99 years	296	---	92	80	---	468
8.0–8.49 years	314	---	86	70	---	470
8.5–8.99 years	299	---	66	55	---	420
9.0–9.49 years	303	---	85	72	---	460
9.5–9.99 years	278	---	86	82	---	446
10.0–10.49 years	304	---	107	68	---	479
10.5–10.99 years	280	---	90	60	---	430
11.0–11.49 years	265	---	81	76	---	422
11.5–11.99 years	260	---	85	67	---	412
12.0–12.49 years	39	257	90	71	---	457
12.5–12.99 years	---	290	87	75	---	452
13.0–13.49 years	---	310	94	71	---	475
13.5–13.99 years	---	272	104	84	---	460
14.0–14.49 years	---	306	95	92	---	493
14.5–14.99 years	---	280	89	89	---	458

Table 8. Unweighted sample sizes for body mass index (BMI)-for-age chart by sex, age, and data source: 2 to 20 years—Con.

Sex and age	NHES[1] II	NHES[1] III	NHANES[2] I	NHANES[2] II	NHANES[2] III	Total
Girls—Con.						
15.0–15.49 years	- - -	241	93	79	- - -	413
15.5–15.99 years	- - -	262	78	68	- - -	408
16.0–16.49 years	- - -	271	67	90	- - -	428
16.5–16.99 years	- - -	265	108	81	- - -	454
17.0–17.49 years	- - -	231	80	71	- - -	382
17.5–17.99 years	- - -	211	77	65	- - -	353
18.0–18.49 years	- - -	27	80	80	- - -	187
18.5–18.99 years	- - -	- - -	64	84	- - -	148
19.0–19.49 years	- - -	- - -	75	86	- - -	161
19.5–19.99 years	- - -	- - -	61	78	- - -	139

- - - Data not available.

[1]National Health Examination Survey.

[2]National Health and Nutrition Examination Survey.

Table 9. Observed mean, standard deviation, and selected percentiles for weight (in kilograms) by sex and age: Birth to 36 months

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
Birth	3.41	0.55	2.28	2.47	2.72	3.08	3.43	3.77	4.08	4.28	4.42
0–0.99 months	---	---	---	---	---	---	---	---	---	---	---
1–1.99 months	---	---	---	---	---	---	---	---	---	---	---
2–2.99 months	6.47	0.79	4.85	4.95	5.55	5.80	6.70	6.85	7.40	7.45	7.80
3–3.99 months	6.96	0.85	5.30	5.35	5.90	6.51	6.95	7.45	8.15	8.45	8.65
4–4.99 months	7.15	0.78	5.50	5.95	6.30	6.65	7.15	7.70	8.00	8.40	8.45
5–5.99 months	7.93	0.92	6.45	6.45	6.70	7.45	7.80	8.55	9.35	9.55	9.75
6–6.99 months	8.41	1.07	6.45	7.00	7.25	7.60	8.39	9.00	10.20	10.70	10.70
7–7.99 months	8.64	1.13	6.90	6.92	7.10	7.83	8.62	9.50	10.09	10.40	10.75
8–8.99 months	9.26	1.13	7.48	7.48	7.85	8.55	9.19	10.05	10.50	11.00	11.25
9–9.99 months	9.33	0.94	7.82	8.05	8.15	8.62	9.30	9.98	10.75	10.89	11.34
10–10.99 months	9.46	1.10	7.75	7.94	8.28	8.73	9.30	10.05	11.25	11.45	11.55
11–11.99 months	9.98	0.99	8.05	8.25	8.65	9.45	9.98	10.60	11.10	11.60	12.00
12–14.99 months	10.59	1.17	8.65	8.90	9.20	9.75	10.55	11.34	12.13	12.35	12.81
15–17.99 months	11.39	1.86	9.30	9.45	9.87	10.45	11.25	12.02	12.81	13.49	13.95
18–20.99 months	12.07	1.54	9.75	9.98	10.43	11.00	11.91	12.70	13.90	15.45	15.65
21–23.99 months	12.43	1.33	10.15	10.40	10.89	11.57	12.36	13.10	14.40	14.74	14.97
24–29.99 months	13.14	1.65	10.55	10.95	11.34	12.10	12.93	14.06	15.08	15.77	16.67
30–35.99 months	13.96	1.53	11.23	11.57	12.02	13.01	13.83	14.74	15.99	16.56	17.30
Girls											
Birth	3.29	0.52	2.24	2.41	2.64	2.98	3.29	3.63	3.92	4.11	4.25
0–0.99 months	---	---	---	---	---	---	---	---	---	---	---
1–1.99 months	---	---	---	---	---	---	---	---	---	---	---
2–2.99 months	5.44	0.54	4.60	4.60	4.75	5.00	5.55	5.85	6.00	6.20	6.35
3–3.99 months	6.34	0.72	5.15	5.40	5.55	5.80	6.30	6.80	7.35	7.75	7.75
4–4.99 months	6.74	0.89	5.25	5.30	5.80	6.05	6.60	7.40	8.00	8.30	8.45
5–5.99 months	7.28	0.88	5.90	6.10	6.30	6.70	7.10	7.70	8.45	8.75	9.05
6–6.99 months	7.66	0.80	6.50	6.58	6.58	7.10	7.55	8.10	8.90	8.96	9.00
7–7.99 months	8.04	1.42	6.24	6.35	6.70	7.37	7.82	8.62	9.35	9.80	9.95
8–8.99 months	8.30	0.94	6.46	6.75	7.25	7.80	8.28	8.85	9.35	9.75	10.10
9–9.99 months	8.85	0.93	7.25	7.40	7.75	8.10	8.73	9.41	10.10	10.45	11.00
10–10.99 months	9.03	1.06	7.30	7.37	7.75	8.39	9.00	9.50	10.43	10.89	11.50
11–11.99 months	9.26	1.01	7.48	7.48	7.90	8.62	9.15	10.05	10.55	10.85	11.10
12–14.99 months	9.79	1.05	8.05	8.28	8.50	9.07	9.80	10.43	11.30	11.57	11.68
15–17.99 months	10.42	1.11	8.65	8.80	9.10	9.65	10.32	11.23	11.80	12.02	12.60
18–20.99 months	11.11	1.36	8.85	9.15	9.64	10.15	10.95	11.91	12.81	13.50	13.95
21–23.99 months	11.81	1.33	9.45	9.75	10.09	10.89	11.79	12.75	13.49	13.90	14.17
24–29.99 months	12.48	1.51	9.95	10.25	10.77	11.45	12.36	13.30	14.51	15.08	15.42
30–35.99 months	13.61	1.69	11.00	11.23	11.79	12.47	13.42	14.52	15.65	16.44	17.10

--- Data not available.

Table 10. Observed mean, standard deviation, and selected percentiles for recumbent length (in centimeters) by sex and age: Birth to 36 months

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
Birth[1]	51.40	2.90	45.70	46.40	48.30	49.50	51.40	53.30	54.60	55.90	55.90
Birth[2]	51.40	2.80	46.00	47.00	48.00	50.00	51.00	53.00	55.00	56.00	56.00
0–0.99 months[3]	52.04	2.46	48.30	48.30	48.80	50.80	52.10	53.30	55.80	55.90	56.80
1–1.99 months[3]	55.54	2.53	50.80	51.40	52.10	53.30	55.90	57.20	58.70	59.70	60.90
2–2.99 months[3]	58.73	2.50	54.60	54.60	55.90	56.80	58.40	60.60	62.20	63.40	63.50
3–3.99 months[4]	62.09	2.52	57.80	58.30	59.00	60.30	61.90	63.50	65.30	66.60	67.30
4–4.99 months[4]	64.15	2.58	59.60	60.00	61.00	62.50	64.10	66.00	67.30	68.60	68.60
5–5.99 months	66.68	3.36	62.70	63.00	63.50	65.00	66.60	67.90	69.70	71.30	71.30
6–6.99 months	68.49	2.45	64.60	64.80	65.80	66.80	68.20	70.20	71.70	71.90	72.80
7–7.99 months	70.17	3.74	64.40	65.20	65.80	67.80	69.60	72.20	74.50	75.70	76.40
8–8.99 months	71.69	3.03	67.00	67.70	68.40	69.60	71.30	73.80	74.90	76.20	78.30
9–9.99 months	72.52	2.93	67.70	67.90	68.90	70.80	72.60	74.00	76.00	76.60	78.80
10–10.99 months	73.18	2.72	68.50	69.50	70.30	71.50	73.30	75.00	76.50	77.80	78.20
11–11.99 months	74.95	3.20	67.80	69.80	71.40	73.40	75.00	76.80	78.60	79.70	80.00
12–14.99 months	77.81	4.33	72.40	72.90	74.10	75.70	77.30	79.50	82.00	82.90	83.80
15–17.99 months	80.64	2.96	75.50	76.20	77.00	78.80	80.40	82.50	84.30	85.50	85.90
18–20.99 months	83.75	4.05	76.20	77.80	80.00	81.60	83.70	86.00	88.40	90.20	91.90
21–23.99 months	86.33	3.22	80.40	80.70	82.30	84.40	86.40	88.20	89.90	90.90	93.00
24–29.99 months	89.18	3.62	82.10	83.00	84.80	87.00	89.10	91.30	93.90	95.50	96.00
30–35.99 months	93.47	3.74	86.00	87.00	88.70	91.10	93.60	95.90	97.80	99.90	100.70
Girls											
Birth[1]	50.60	2.80	45.10	45.70	47.00	48.90	50.80	52.10	54.00	54.60	55.90
Birth[2]	50.60	2.70	46.00	46.00	47.00	48.00	51.00	52.00	53.00	55.00	56.00
0–0.99 months[3]	51.26	2.28	47.30	48.20	48.30	49.50	50.80	53.30	54.00	55.20	55.90
1–1.99 months[3]	54.54	2.32	50.80	50.80	51.40	53.30	54.30	55.90	57.80	58.40	59.00
2–2.99 months[3]	57.40	2.29	53.30	53.70	54.60	55.90	57.20	58.70	60.30	61.00	61.60
3–3.99 months[4]	60.79	2.74	55.90	56.70	57.50	59.10	61.00	62.50	63.80	64.80	65.50
4–4.99 months[4]	62.57	2.68	57.30	58.00	58.40	61.00	62.80	64.10	66.00	67.10	67.70
5–5.99 months	64.53	2.01	61.20	61.20	61.70	63.20	64.60	65.80	67.10	68.00	68.20
6–6.99 months	66.91	3.34	62.80	63.30	64.00	65.00	66.70	68.40	70.00	70.90	71.60
7–7.99 months	67.28	2.91	61.40	62.20	63.40	66.00	67.40	68.70	70.90	72.10	72.80
8–8.99 months	69.01	2.59	64.00	64.90	65.60	67.40	68.80	70.70	72.00	73.10	74.30
9–9.99 months	71.01	2.61	66.50	66.80	67.80	69.50	71.00	72.70	74.00	75.50	77.40
10–10.99 months	72.00	2.77	66.00	67.10	68.70	70.30	72.10	73.80	75.40	76.50	77.40
11–11.99 months	73.37	3.96	65.80	68.60	68.80	71.80	73.50	74.90	76.70	78.30	78.80
12–14.99 months	75.83	3.24	69.90	70.00	71.40	73.80	76.20	77.60	79.40	80.50	81.00
15–17.99 months	78.64	3.01	72.40	73.00	75.00	76.90	78.90	80.50	82.10	83.00	84.10
18–20.99 months	81.92	3.77	74.80	76.10	77.50	79.60	81.60	84.50	86.80	87.50	89.10
21–23.99 months	84.70	3.37	79.10	79.20	80.70	82.40	84.50	87.00	88.80	89.90	90.40
24–29.99 months	87.97	3.70	80.80	82.40	83.80	85.60	88.00	90.10	92.90	94.40	95.30
30–35.99 months	92.49	3.59	85.90	86.50	87.90	90.10	92.30	95.00	97.20	98.50	99.70

[1]State of Missouri Vital Statistics birth length data (1989–94).

[2]State of Wisconsin Vital Statistics birth length data (1989–94).

[3]Pediatric Nutrition Surveillance System (PedNSS) data (selected clinics, 1975–95).

[4]Mix of national survey data and PedNSS data.

Table 11. Observed mean, standard deviation, and selected percentiles for weight (in kilograms) by sex and recumbent length: Birth to 36 months

Sex and length interval	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
45–46.99[1] centimeters	2.68	0.38	1.96	2.04	2.18	2.41	2.67	2.92	3.15	3.29	3.40
47–48.99[1] centimeters	3.04	0.36	2.35	2.47	2.58	2.81	3.03	3.29	3.50	3.63	3.74
49–50.99[1] centimeters	3.36	0.36	2.69	2.78	2.92	3.12	3.35	3.60	3.83	3.97	4.05
51–52.99[1] centimeters	3.59	0.35	2.95	3.03	3.15	3.35	3.57	3.81	4.03	4.18	4.28
45–46.99[2] centimeters	2.53	0.39	1.87	1.94	2.04	2.26	2.50	2.78	3.03	3.20	3.32
47–48.99[2] centimeters	2.95	0.39	2.26	2.33	2.47	2.69	2.95	3.20	3.46	3.60	3.71
49–50.99[2] centimeters	3.30	0.37	2.64	2.72	2.84	3.06	3.29	3.54	3.77	3.91	4.03
51–52.99[2] centimeters	3.53	0.36	2.89	2.97	3.09	3.29	3.52	3.76	4.00	4.14	4.22
65–66.99 centimeters	7.59	0.70	6.45	6.45	6.70	7.10	7.60	7.90	8.60	8.80	9.35
67–68.99 centimeters	8.28	0.91	6.95	7.30	7.45	7.75	8.10	8.60	9.15	9.55	10.30
69–70.99 centimeters	8.73	0.77	7.48	7.48	7.65	8.16	8.70	9.30	9.70	9.87	10.40
71–72.99 centimeters	9.25	0.76	7.80	8.05	8.28	8.70	9.20	9.75	10.20	10.55	10.75
73–74.99 centimeters	9.74	0.78	8.45	8.62	8.73	9.19	9.65	10.32	10.77	11.00	11.45
75–76.99 centimeters	10.17	0.76	8.85	9.07	9.30	9.64	10.09	10.66	11.11	11.45	11.60
77–78.99 centimeters	10.59	0.86	8.96	9.19	9.45	9.98	10.55	11.34	11.60	11.91	12.20
79–80.99 centimeters	11.24	1.98	9.41	9.64	9.87	10.55	11.11	11.60	12.15	12.70	13.15
81–82.99 centimeters	11.53	0.94	9.98	10.21	10.43	10.89	11.55	12.13	12.59	12.85	13.27
83–84.99 centimeters	11.88	1.12	9.75	10.30	10.55	11.11	11.79	12.60	13.38	13.83	14.40
85–86.99 centimeters	12.31	1.03	10.77	10.89	11.20	11.68	12.13	12.81	13.72	14.15	14.40
87–88.99 centimeters	12.67	1.04	10.66	11.00	11.45	12.02	12.65	13.27	13.95	14.74	14.86
89–90.99 centimeters	13.19	1.22	11.25	11.45	11.95	12.40	12.93	13.83	14.63	15.90	16.67
91–92.99 centimeters	13.54	1.04	11.57	11.65	12.13	12.81	13.55	14.29	14.86	15.05	15.30
93–94.99 centimeters	14.04	0.94	12.20	12.48	12.80	13.50	13.95	14.70	15.40	15.65	15.90
95–96.99 centimeters	14.59	1.16	12.70	12.75	13.10	13.80	14.52	15.42	15.99	16.33	16.80
97–98.99 centimeters	15.25	1.26	13.15	13.30	13.80	14.40	15.10	15.95	17.01	17.45	17.92
99–100.99 centimeters	15.64	1.14	13.55	13.80	14.40	14.74	15.54	16.33	17.15	18.03	18.05
101–102.99 centimeters	16.20	1.14	14.45	14.45	14.90	15.20	16.10	16.90	17.80	17.90	18.26
Girls											
45–46.99[1] centimeters	2.73	0.37	2.01	2.10	2.24	2.50	2.72	2.98	3.18	3.32	3.43
47–48.99[1] centimeters	3.04	0.36	2.35	2.47	2.58	2.81	3.03	3.29	3.50	3.63	3.74
49–50.99[1] centimeters	3.36	0.36	2.69	2.78	2.92	3.12	3.35	3.60	3.83	3.97	4.05
51–52.99[1] centimeters	3.59	0.35	2.95	3.03	3.15	3.35	3.57	3.81	4.03	4.18	4.28
45–46.99[2] centimeters	2.58	0.39	1.90	1.99	2.10	2.32	2.58	2.84	3.09	3.23	3.34
47–48.99[2] centimeters	2.97	0.37	2.29	2.36	2.50	2.72	2.95	3.20	3.43	3.60	3.69
49–50.99[2] centimeters	3.28	0.36	2.64	2.72	2.84	3.03	3.26	3.52	3.74	3.88	3.99
51–52.99[2] centimeters	3.50	0.35	2.86	2.95	3.06	3.26	3.49	3.71	3.94	4.08	4.20
65–66.99 centimeters	7.48	0.69	6.55	6.58	6.60	7.03	7.45	7.82	8.55	8.75	8.95
67–68.99 centimeters	8.34	1.18	7.03	7.14	7.26	7.75	8.25	8.65	9.10	9.53	10.65
69–70.99 centimeters	8.61	0.91	7.14	7.35	7.65	8.05	8.40	9.15	9.75	10.30	10.50
71–72.99 centimeters	8.87	0.74	7.71	7.75	7.94	8.35	8.75	9.41	9.90	10.30	10.32
73–74.99 centimeters	9.50	0.79	8.16	8.35	8.62	9.07	9.40	9.95	10.43	10.75	11.00
75–76.99 centimeters	9.77	0.73	8.73	8.73	8.85	9.30	9.65	10.25	10.66	10.95	11.20
77–78.99 centimeters	10.21	0.86	8.73	8.85	8.96	9.64	10.10	10.77	11.40	11.79	11.91
79–80.99 centimeters	10.54	0.85	9.07	9.30	9.53	9.90	10.55	11.11	11.68	11.90	12.20
81–82.99 centimeters	11.08	1.00	9.64	9.75	9.85	10.35	11.00	11.57	12.30	12.81	13.15
83–84.99 centimeters	11.49	0.98	9.95	10.09	10.20	10.80	11.45	12.13	12.80	13.38	13.50
85–86.99 centimeters	11.92	0.96	10.21	10.43	10.77	11.25	11.91	12.47	13.20	13.72	13.83
87–88.99 centimeters	12.38	1.02	10.77	10.89	11.23	11.68	12.36	12.95	13.49	14.06	15.00
89–90.99 centimeters	12.90	1.10	11.20	11.45	11.68	12.15	12.73	13.40	14.55	15.08	15.25
91–92.99 centimeters	13.31	1.12	11.30	11.57	11.95	12.59	13.40	13.95	14.74	15.10	15.65
93–94.99 centimeters	13.83	1.15	11.79	11.91	12.47	13.05	13.72	14.65	15.40	15.54	15.76
95–96.99 centimeters	14.24	1.14	12.40	12.59	12.81	13.50	14.17	14.86	15.70	16.30	16.50
97–98.99 centimeters	15.13	1.30	13.25	13.45	13.72	14.17	14.95	15.88	16.56	17.35	17.55
99–100.99 centimeters	15.87	2.01	13.40	13.40	14.15	14.65	15.50	16.44	17.71	19.05	22.85
101–102.99 centimeters	16.24	1.49	13.60	13.85	14.63	15.25	16.10	16.95	17.92	19.05	19.63

[1]State of Missouri Vital Statistics birth length data.

[2]State of Wisconsin Vital Statistics birth length data.

Table 12. Observed mean, standard deviation, and selcted percentiles for head circumference (in centimeters) by sex and age: Birth to 36 months

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
Birth[1]	35.68	2.32	31.75	32.00	33.00	34.29	35.56	37.07	38.50	39.00	39.30
0–0.99 months	---	---	---	---	---	---	---	---	---	---	---
1–1.99 months	---	---	---	---	---	---	---	---	---	---	---
2–2.99 months	40.70	1.42	36.40	38.60	39.20	40.20	40.90	41.40	42.40	42.80	42.90
3–3.99 months	41.72	1.15	38.90	39.70	40.20	41.10	41.70	42.60	43.10	43.10	43.30
4–4.99 months	42.13	1.12	39.90	40.00	40.80	41.50	42.10	42.80	43.80	44.00	44.30
5–5.99 months	43.37	1.58	40.20	40.80	41.80	42.30	43.40	44.50	45.20	46.00	46.40
6–6.99 months	44.23	1.39	42.20	42.40	42.60	43.20	44.00	44.90	46.10	46.80	47.20
7–7.99 months	44.54	1.44	42.00	42.20	42.80	43.60	44.40	45.60	46.30	46.70	47.60
8–8.99 months	45.36	1.44	42.60	42.70	43.20	44.50	45.30	46.20	47.40	47.70	48.10
9–9.99 months	45.39	1.20	43.20	43.60	43.70	44.70	45.40	46.20	46.80	47.40	47.70
10–10.99 months	45.61	1.33	43.20	43.70	43.70	44.70	45.70	46.40	47.30	47.60	48.20
11–11.99 months	46.29	1.46	44.10	44.30	44.80	45.20	46.30	47.20	48.00	48.40	48.80
12–14.99 months	46.99	1.50	44.40	44.70	45.30	46.20	47.00	47.80	48.60	49.40	49.90
15–17.99 months	47.60	1.36	45.00	45.70	46.10	46.70	47.50	48.50	49.10	49.90	50.20
18–20.99 months	47.99	1.37	45.20	45.50	46.20	47.20	48.00	48.90	49.70	50.10	50.40
21–23.99 months	48.42	1.71	46.00	46.30	46.70	47.60	48.30	49.50	50.10	50.50	51.30
24–29.99 months	48.95	1.49	46.10	46.40	47.00	48.10	49.00	49.90	50.70	51.20	51.60
30–35.99 months	49.45	1.68	46.20	47.00	47.50	48.50	49.50	50.40	51.20	52.00	52.20
Girls											
Birth[1]	35.01	1.76	31.80	32.00	33.00	33.80	35.00	36.40	37.20	38.00	38.50
0–0.99 months	---	---	---	---	---	---	---	---	---	---	---
1–1.99 months	---	---	---	---	---	---	---	---	---	---	---
2–2.99 months	38.73	1.19	36.90	37.10	37.10	37.80	38.60	39.70	40.30	41.20	41.20
3–3.99 months	40.53	1.16	38.70	39.00	39.30	39.80	40.30	41.20	42.00	42.60	43.20
4–4.99 months	41.44	1.65	38.90	39.20	39.60	40.40	41.50	42.40	43.00	43.40	44.70
5–5.99 months	42.08	1.14	39.90	40.20	40.70	41.40	42.00	42.60	44.00	44.40	44.40
6–6.99 months	42.81	1.29	40.70	40.80	41.20	41.80	42.60	43.90	44.80	45.00	45.50
7–7.99 months	43.06	1.53	39.90	40.30	41.30	42.40	43.20	44.00	44.70	45.20	45.70
8–8.99 months	44.12	1.54	41.60	42.20	42.70	43.20	44.00	45.10	45.60	46.40	47.20
9–9.99 months	44.33	1.13	42.20	42.60	42.80	43.70	44.30	45.00	46.00	46.20	46.40
10–10.99 months	44.58	1.24	42.00	42.40	43.00	44.00	44.50	45.40	46.30	46.70	47.00
11–11.99 months	45.14	1.24	42.50	43.20	43.50	44.20	45.30	46.00	46.50	47.20	47.60
12–14.99 months	45.52	1.40	43.10	43.50	43.80	44.60	45.60	46.30	47.00	48.00	48.10
15–17.99 months	45.96	1.47	43.50	43.80	44.50	45.20	46.00	46.90	47.70	48.10	48.50
18–20.99 months	46.59	1.54	43.40	44.00	44.80	45.60	46.50	47.60	48.60	49.20	49.60
21–23.99 months	47.41	1.69	45.00	45.40	45.70	46.40	47.50	48.20	49.00	49.60	49.60
24–29.99 months	47.70	1.51	44.70	45.00	46.00	46.80	47.80	48.60	49.40	49.90	50.20
30–35.99 months	48.46	1.63	45.90	46.20	46.50	47.50	48.40	49.30	50.20	50.80	51.40

--- Data not available.

[1]Fels Research Institute data.

Table 13. Observed mean, standard deviation, and selected percentiles for weight (in kilograms) by sex and stature: 77 to 121 cm

Sex and stature interval	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
77–78.99 centimeters	9.87	0.00	9.87	9.87	9.87	9.87	9.87	9.87	9.87	9.87	9.87
79–80.99 centimeters	10.45	0.86	9.41	9.41	9.41	9.45	10.55	11.11	11.70	11.70	11.70
81–82.99 centimeters	10.91	0.90	9.30	9.30	9.64	10.32	11.00	11.34	11.68	12.65	12.65
83–84.99 centimeters	11.77	1.25	10.05	10.32	10.66	10.89	11.57	12.40	13.20	15.08	15.08
85–86.99 centimeters	12.19	0.90	10.89	11.00	11.11	11.57	12.13	12.81	13.61	13.72	14.05
87–88.99 centimeters	12.65	0.91	11.20	11.23	11.55	12.02	12.50	13.15	13.75	14.06	14.74
89–90.99 centimeters	13.11	1.00	11.34	11.57	11.91	12.45	13.04	13.72	14.51	14.63	14.97
91–92.99 centimeters	13.78	1.02	11.91	12.13	12.48	13.00	13.72	14.63	15.05	15.42	15.54
93–94.99 centimeters	14.24	1.13	12.15	12.59	12.93	13.60	14.17	14.95	15.55	16.22	16.33
95–96.99 centimeters	14.78	1.14	12.81	13.15	13.49	13.95	14.63	15.54	16.10	16.78	17.10
97–98.99 centimeters	15.35	1.41	13.27	13.55	13.75	14.63	15.08	16.00	17.12	17.90	18.26
99–100.99 centimeters	15.70	1.20	13.49	13.80	14.29	14.97	15.60	16.33	17.24	17.92	18.14
101–102.99 centimeters	16.47	1.33	14.17	14.40	14.95	15.54	16.44	17.25	18.00	18.65	18.95
103–104.99 centimeters	17.02	1.25	15.00	15.31	15.60	16.20	17.01	17.70	18.55	19.28	19.62
105–106.99 centimeters	17.59	1.58	15.31	15.54	15.88	16.56	17.46	18.35	19.28	19.73	20.64
107–108.99 centimeters	18.45	1.80	15.88	16.15	16.67	17.24	18.14	19.05	20.64	22.11	22.85
109–110.99 centimeters	18.70	1.83	16.10	16.33	16.90	17.46	18.60	19.62	20.64	21.32	22.23
111–112.99 centimeters	20.13	2.81	16.85	17.01	17.75	18.60	19.55	20.98	22.68	24.90	27.90
113–114.99 centimeters	20.53	2.12	17.46	17.95	18.71	19.39	20.30	21.32	22.34	23.70	25.95
115–116.99 centimeters	21.07	2.35	18.14	18.26	18.82	19.96	20.65	21.77	22.91	24.35	24.80
117–118.99 centimeters	21.51	2.09	18.03	18.14	19.28	20.30	21.32	22.34	24.04	25.63	26.20
119–120.99 centimeters	22.62	2.67	19.16	19.84	20.29	20.87	22.23	23.81	24.95	27.67	28.46
Girls											
77–78.99 centimeters	11.00	0.96	8.20	8.20	10.75	10.75	10.75	11.79	11.79	11.79	11.79
79–80.99 centimeters	10.15	0.59	9.53	9.53	9.53	9.75	10.09	10.50	11.00	11.00	11.00
81–82.99 centimeters	11.32	1.50	9.95	10.09	10.10	10.55	10.90	11.75	12.70	12.81	15.35
83–84.99 centimeters	11.55	1.01	9.75	9.75	10.32	10.90	11.45	12.20	12.59	13.25	13.85
85–86.99 centimeters	11.92	0.86	10.40	10.55	10.77	11.25	12.02	12.59	13.04	13.20	13.61
87–88.99 centimeters	12.37	1.02	10.60	10.80	11.23	11.68	12.36	12.93	13.61	13.85	14.63
89–90.99 centimeters	13.00	1.13	11.34	11.57	11.79	12.20	12.81	13.61	14.63	15.08	15.10
91–92.99 centimeters	13.47	1.14	11.65	11.90	12.25	12.81	13.38	13.95	14.80	15.54	16.10
93–94.99 centimeters	13.99	1.12	12.02	12.40	12.70	13.27	13.83	14.66	15.40	15.76	16.40
95–96.99 centimeters	14.67	1.41	12.47	12.70	13.15	13.83	14.45	15.31	16.30	17.15	17.35
97–98.99 centimeters	14.94	1.37	12.93	13.04	13.40	14.00	14.86	15.76	16.56	17.12	17.46
99–100.99 centimeters	15.78	1.68	13.38	13.55	14.06	14.70	15.55	16.55	17.58	18.48	19.30
101–102.99 centimeters	16.27	1.76	13.95	14.06	14.40	15.10	16.05	17.01	18.26	19.10	19.80
103–104.99 centimeters	16.92	2.11	14.29	14.55	15.05	15.76	16.67	17.69	18.82	19.39	20.50
105–106.99 centimeters	17.41	1.74	15.10	15.50	15.76	16.33	17.12	18.25	19.39	20.65	20.87
107–108.99 centimeters	18.17	1.71	15.31	15.54	16.33	17.12	18.15	19.05	20.07	20.35	21.43
109–110.99 centimeters	18.58	1.86	16.10	16.33	16.78	17.35	18.26	19.70	20.75	21.60	22.45
111–112.99 centimeters	19.60	3.02	16.33	16.44	17.12	17.80	19.30	20.30	21.89	23.10	25.05
113–114.99 centimeters	20.36	2.54	17.01	17.01	17.69	18.71	19.84	21.43	24.15	25.80	25.86
115–116.99 centimeters	21.42	3.23	17.69	18.03	18.37	19.28	20.53	22.45	27.10	28.30	29.25
117–118.99 centimeters	21.50	2.04	18.60	19.05	19.28	19.84	21.32	22.68	24.15	24.83	26.76
119–120.99 centimeters	22.65	2.84	19.39	19.62	19.96	20.75	21.77	23.81	26.88	28.10	28.58

Table 14. Observed mean, standard deviation, and selected percentiles for weight (in kilograms) by sex and age: 2 to 20 years

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
2–2.49 years	13.13	1.65	10.55	10.89	11.33	12.05	12.93	14.06	15.08	15.77	16.67
2.5–2.99 years	13.95	1.53	11.23	11.57	12.02	13.00	13.83	14.74	15.95	16.56	17.30
3.0–3.49 years	15.08	1.76	12.05	12.47	12.93	13.83	14.95	16.15	17.35	18.00	18.45
3.5–3.99 years	16.20	2.48	13.04	13.38	13.95	14.95	15.80	17.10	18.26	19.39	20.07
4.0–4.49 years	17.20	2.28	13.49	13.75	14.70	15.75	17.01	18.40	19.70	21.00	22.23
4.5–4.99 years	18.11	2.41	14.06	14.52	15.35	16.56	17.92	19.39	20.98	22.20	23.02
5.0–5.49 years	19.49	2.96	15.31	15.76	16.22	17.58	19.16	20.90	22.34	24.10	25.86
5.5–5.99 years	20.47	3.05	15.90	16.44	17.12	18.37	20.25	22.05	24.04	25.85	27.10
6.0–6.49 years	21.56	3.24	16.67	17.24	17.69	19.62	21.32	22.91	25.51	28.12	28.92
6.5–6.99 years	22.92	3.77	17.24	18.14	19.05	20.41	22.11	24.38	27.67	30.05	31.52
7.0–7.49 years	24.07	3.83	18.26	18.82	19.73	21.32	23.81	26.08	28.35	30.50	32.89
7.5–7.99 years	25.58	3.94	19.05	19.96	21.21	22.91	25.29	27.44	30.73	33.91	34.47
8.0–8.49 years	26.43	4.52	19.05	20.41	22.00	23.59	25.63	28.58	31.52	35.27	36.51
8.5–8.99 years	28.46	5.48	21.55	22.68	23.59	25.17	27.67	30.50	34.02	37.19	39.80
9.0–9.49 years	30.55	6.50	21.89	22.91	23.81	26.08	29.37	33.11	39.01	42.18	44.45
9.5–9.99 years	31.86	7.07	23.02	24.15	25.40	27.33	30.73	34.25	40.37	43.55	47.40
10.0–10.49 years	33.47	6.39	24.38	25.29	26.42	29.14	32.55	36.63	41.05	45.13	50.69
10.5–10.99 years	36.06	7.71	26.54	27.56	28.24	30.73	34.47	39.24	45.59	53.41	55.34
11.0–11.49 years	37.61	7.61	26.76	28.01	29.03	32.77	36.29	40.94	48.76	52.05	52.84
11.5–11.99 years	40.39	10.31	28.35	28.69	31.07	34.02	37.65	44.68	54.32	61.01	64.68
12.0–12.49 years	42.07	9.33	29.03	30.50	31.75	35.83	40.14	46.83	54.21	59.65	63.16
12.5–12.99 years	44.89	9.90	30.39	31.98	33.68	38.10	43.32	49.22	57.15	64.07	67.59
13.0–13.49 years	47.94	10.68	33.79	34.02	36.40	39.92	46.38	54.20	62.03	68.95	73.60
13.5–13.99 years	51.69	12.13	34.93	36.06	37.54	44.11	49.89	58.51	66.34	71.10	74.84
14.0–14.49 years	54.97	11.13	37.87	39.01	42.64	47.63	53.52	61.92	68.04	72.69	76.88
14.5–14.99 years	57.90	11.68	40.37	41.62	44.45	50.58	56.81	63.05	72.80	78.59	86.07
15.0–15.49 years	59.48	11.55	42.18	43.54	47.85	51.94	57.72	64.98	71.89	77.34	80.17
15.5–15.99 years	62.65	11.58	43.54	46.72	50.35	56.02	61.35	67.93	75.75	85.73	90.38
16.0–16.49 years	64.63	11.94	47.85	50.46	53.07	55.91	62.71	69.17	78.47	89.58	94.24
16.5–16.99 years	67.83	12.06	50.35	51.03	55.00	59.42	66.11	74.96	82.21	88.68	91.06
17.0–17.49 years	67.64	12.23	49.44	50.92	53.75	60.10	65.66	72.80	83.80	92.31	96.05
17.5–17.99 years	67.87	11.18	50.46	52.16	55.11	60.56	66.22	73.82	81.42	90.38	93.33
18.0–18.49 years	73.09	14.72	54.09	55.34	57.83	62.71	71.21	78.25	89.13	102.85	106.37
18.5–18.99 years	71.43	12.25	52.84	53.75	57.04	63.16	69.85	77.34	89.02	93.78	96.50
19.0–19.49 years	72.24	11.37	55.11	55.91	59.42	64.41	70.76	77.79	86.98	92.19	95.82
19.5–19.99 years	72.21	12.26	54.88	55.68	57.38	64.07	70.31	78.02	87.66	99.22	102.85
Girls											
2–2.49 years	12.47	1.54	9.95	10.21	10.77	11.45	12.36	13.30	14.51	15.08	15.42
2.5–2.99 years	13.59	1.70	11.00	11.23	11.79	12.47	13.38	14.52	15.65	16.44	17.10
3.0–3.49 years	14.65	2.02	11.45	11.75	12.35	13.38	14.40	15.73	17.12	18.03	18.94
3.5–3.99 years	15.57	2.09	12.40	12.59	13.27	14.17	15.31	16.75	17.92	18.95	19.63
4.0–4.49 years	16.79	2.53	13.49	13.72	14.15	15.08	16.44	18.25	19.73	20.87	21.62
4.5–4.99 years	17.63	3.21	13.49	13.95	14.63	15.76	17.24	18.80	20.65	21.89	24.45
5.0–5.49 years	18.97	3.13	14.40	14.60	15.65	16.90	18.48	20.30	22.68	25.65	26.65
5.5–5.99 years	20.53	3.80	15.65	16.10	16.85	17.90	19.80	22.11	25.25	28.10	28.92
6.0–6.49 years	21.11	3.39	15.99	16.56	17.35	18.82	20.64	23.02	25.40	26.99	27.67
6.5–6.99 years	22.16	3.84	16.67	17.12	17.92	19.62	21.55	23.81	27.67	29.48	30.84
7.0–7.49 years	23.58	3.95	18.14	18.60	19.28	20.87	22.91	25.51	27.90	30.84	33.11
7.5–7.99 years	25.04	4.67	18.94	19.28	20.18	21.89	24.27	26.99	30.39	32.66	35.15
8.0–8.49 years	26.64	4.69	19.73	20.64	21.32	23.13	25.85	29.48	33.34	34.93	37.08
8.5–8.99 years	28.59	6.13	21.09	21.77	22.57	24.38	27.67	30.73	36.51	41.05	42.41
9.0–9.49 years	30.59	6.21	22.57	22.79	23.93	26.31	29.26	33.23	39.58	43.21	45.13
9.5–9.99 years	32.74	7.87	22.79	23.81	25.40	27.56	30.84	35.38	44.45	47.85	50.35
10.0–10.49 years	34.02	7.51	24.04	25.06	25.85	28.12	32.89	37.65	44.68	47.97	49.67
10.5–10.99 years	35.72	7.57	25.40	26.31	27.90	30.62	34.25	39.01	45.81	49.33	53.30
11.0–11.49 years	39.28	8.79	26.31	28.12	29.82	32.89	38.10	44.00	51.03	56.59	59.08
11.5–11.99 years	42.37	10.69	29.03	29.48	30.62	34.93	39.92	47.40	57.15	63.50	66.34
12.0–12.49 years	44.89	9.85	29.71	30.62	33.34	38.10	43.54	50.12	57.61	62.60	69.29
12.5–12.99 years	47.88	10.21	32.20	33.45	36.29	40.60	46.49	53.75	61.23	66.00	70.08
13.0–13.49 years	50.49	11.46	34.70	35.95	38.90	42.41	48.53	56.02	65.54	75.18	79.15
13.5–13.99 years	51.64	11.17	36.17	36.97	39.01	44.57	50.12	56.36	66.22	72.12	78.70
14.0–14.49 years	53.78	11.19	37.42	39.01	41.73	46.27	51.94	59.99	67.36	75.30	83.69
14.5–14.99 years	55.10	10.92	40.26	40.94	43.32	47.51	52.96	59.99	69.51	75.07	78.92

Table 14. Observed mean, standard deviation, and selected percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.											
15.0–15.49 years	55.22	11.20	40.82	42.52	44.11	47.74	52.84	59.65	70.65	77.11	81.99
15.5–15.99 years	56.96	10.57	42.86	44.45	46.27	49.56	56.25	60.89	66.79	76.54	82.78
16.0–16.49 years	57.36	10.94	43.32	43.89	45.81	50.12	54.89	62.48	72.35	79.38	86.52
16.5–16.99 years	57.70	11.44	43.20	44.11	45.59	50.69	55.45	61.80	71.21	78.70	88.22
17.0–17.49 years	58.23	12.90	42.41	43.32	46.04	51.14	56.02	62.14	71.21	81.76	85.73
17.5–17.99 years	59.81	11.40	43.77	45.25	49.33	52.84	57.61	63.62	72.69	84.71	91.29
18.0–18.49 years	59.04	11.76	44.68	44.91	46.72	51.94	57.04	62.26	72.58	83.69	96.39
18.5–18.99 years	58.17	9.36	42.64	44.00	47.74	52.73	56.47	63.16	69.74	78.02	79.49
19.0–19.49 years	58.52	11.44	42.87	46.04	48.76	52.05	56.13	62.82	70.19	78.13	84.71
19.5–19.99 years	61.20	11.98	48.99	49.21	50.80	54.20	57.95	64.86	77.00	80.85	88.68

Table 15. Observed mean, standard deviation, and selected percentiles for stature (in centimeters) by sex and age: 2 to 20 years

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys											
2–2.49 years	89.10	3.66	82.50	83.60	85.00	86.70	88.90	91.20	93.80	95.50	97.40
2.5–2.99 years	92.78	3.60	85.80	86.60	88.50	90.40	92.70	95.20	97.20	98.40	100.00
3.0–3.49 years	96.82	4.03	89.20	90.50	92.00	94.20	96.70	99.60	101.80	103.30	104.80
3.5–3.99 years	100.45	4.05	92.90	94.20	95.40	97.50	100.60	103.00	105.30	107.20	107.80
4.0–4.49 years	104.00	4.43	96.00	96.90	98.80	101.30	104.20	106.80	109.20	111.80	112.60
4.5–4.99 years	107.14	4.63	98.20	99.50	100.80	104.00	107.00	110.30	113.30	115.00	115.80
5.0–5.49 years	110.94	4.92	102.00	103.10	105.00	107.60	111.10	114.00	117.10	118.80	120.50
5.5–5.99 years	113.89	4.92	104.50	106.30	108.00	110.40	114.00	117.40	120.20	122.00	122.20
6.0–6.49 years	117.21	5.45	107.80	108.50	110.00	113.30	117.20	121.00	123.70	126.10	127.30
6.5–6.99 years	120.19	5.49	109.10	110.90	113.20	116.50	119.90	124.00	127.50	129.10	129.50
7.0–7.49 years	123.47	5.62	113.10	114.40	116.80	119.90	123.10	126.70	131.00	132.80	134.70
7.5–7.99 years	126.61	5.90	115.60	117.30	120.20	123.20	126.80	130.20	133.90	136.30	138.00
8.0–8.49 years	128.62	5.76	118.20	119.50	121.80	124.90	128.70	132.60	135.70	137.20	138.60
8.5–8.99 years	131.58	5.93	122.10	123.20	124.60	127.00	131.60	135.20	139.70	142.10	142.90
9.0–9.49 years	134.71	6.22	121.80	124.10	126.90	130.70	135.00	138.40	142.00	145.80	147.00
9.5–9.99 years	136.91	6.51	125.20	127.10	129.40	132.60	136.80	141.00	145.20	148.00	149.10
10.0–10.49 years	139.59	7.67	126.30	127.90	130.60	135.60	140.10	144.50	147.80	151.90	152.70
10.5–10.99 years	142.32	6.61	130.50	132.30	133.80	137.50	142.30	147.00	150.30	153.30	154.40
11.0–11.49 years	144.65	6.87	132.00	133.70	135.80	140.20	144.50	149.40	153.00	155.20	156.70
11.5–11.99 years	147.90	7.31	135.90	137.20	139.50	143.80	147.20	152.30	157.20	160.00	161.60
12.0–12.49 years	151.43	8.05	137.80	138.50	141.40	146.30	150.90	156.80	163.10	166.20	168.30
12.5–12.99 years	154.79	7.81	140.20	142.00	144.60	150.00	154.30	160.00	164.50	167.40	169.50
13.0–13.49 years	158.49	8.47	143.40	145.20	148.30	152.60	157.80	163.90	170.80	173.10	174.30
13.5–13.99 years	160.98	8.88	143.30	145.10	148.90	154.10	161.90	167.70	172.40	175.60	176.00
14.0–14.49 years	166.13	8.53	148.60	151.50	156.00	160.80	166.00	172.00	177.30	179.40	180.50
14.5–14.99 years	168.42	7.79	152.00	154.60	158.40	163.50	168.60	174.10	178.40	179.90	181.40
15.0–15.49 years	170.61	7.67	156.00	158.10	161.00	165.30	170.80	175.60	180.90	183.80	185.70
15.5–15.99 years	172.39	7.47	158.40	159.00	162.70	167.30	173.10	177.50	182.50	184.40	185.70
16.0–16.49 years	173.31	6.78	160.40	161.90	164.20	169.50	173.30	177.70	181.20	184.80	186.70
16.5–16.99 years	175.63	7.46	162.50	163.60	165.50	170.30	175.70	181.10	185.80	187.70	190.20
17.0–17.49 years	175.78	7.92	160.80	162.70	166.50	170.90	176.10	181.30	186.30	188.20	188.50
17.5–17.99 years	176.10	6.88	162.20	163.80	167.90	171.90	175.70	180.90	185.20	187.40	188.20
18.0–18.49 years	177.53	6.87	166.30	168.00	169.30	173.20	176.40	181.90	187.80	190.40	192.60
18.5–18.99 years	176.51	7.01	165.80	166.40	167.20	171.60	176.60	180.60	185.40	188.00	191.30
19.0–19.49 years	175.86	6.30	163.70	164.70	167.90	171.30	176.50	180.80	183.20	185.40	187.00
19.5–19.99 years	176.25	6.36	162.00	164.30	169.50	171.80	176.70	180.00	184.20	186.30	188.40
Girls											
2–2.49 years	87.73	4.03	80.00	82.00	82.90	85.20	87.60	90.20	93.10	94.60	94.90
2.5–2.99 years	81.82	3.76	85.00	85.80	87.00	89.10	91.90	94.20	96.80	97.80	98.80
3.0–3.49 years	95.75	3.97	88.30	89.10	90.80	93.40	95.70	98.30	100.80	102.90	103.50
3.5–3.99 years	99.67	4.21	92.40	93.20	94.70	97.00	99.30	102.40	104.90	106.30	107.80
4.0–4.49 years	103.05	4.54	94.80	95.70	97.20	99.80	103.20	106.30	108.40	110.20	111.50
4.5–4.99 years	105.98	4.88	97.40	97.70	99.70	102.70	105.60	109.30	112.20	113.90	115.00
5.0–5.49 years	109.87	4.70	101.10	101.90	104.10	107.00	109.90	113.10	115.50	117.20	118.80
5.5–5.99 years	113.77	5.37	103.90	105.20	107.10	110.50	113.60	117.00	120.50	122.80	125.30
6.0–6.49 years	116.46	5.39	106.80	107.90	109.80	112.60	116.00	120.10	123.80	125.10	126.90
6.5–6.99 years	119.30	5.66	109.30	110.10	111.80	115.40	119.00	122.90	126.50	128.80	129.90
7.0–7.49 years	122.52	5.48	112.80	113.80	116.20	118.60	122.00	126.00	128.90	131.40	133.70
7.5–7.99 years	125.27	6.36	114.40	116.20	117.90	121.20	125.20	129.40	133.10	136.50	138.20
8.0–8.49 years	128.29	5.83	117.80	118.50	120.60	124.30	128.70	132.00	135.60	138.00	138.60
8.5–8.99 years	131.41	5.88	120.30	122.00	124.60	127.60	131.80	135.30	138.70	140.70	141.30
9.0–9.49 years	134.30	6.96	122.30	123.60	126.40	129.60	134.50	139.00	142.50	146.30	148.60
9.5–9.99 years	136.83	6.76	124.80	127.00	128.40	132.60	136.50	141.00	145.00	148.40	149.30
10.0–10.49 years	139.85	6.98	127.50	129.20	131.50	135.20	139.80	144.30	148.40	152.00	152.70
10.5–10.99 years	142.88	7.04	129.40	130.50	133.80	138.40	142.50	147.40	152.20	155.00	156.80
11.0–11.49 years	146.64	7.53	132.80	134.50	136.40	141.60	147.00	152.20	155.80	157.80	159.40
11.5–11.99 years	149.91	7.89	135.70	138.70	140.60	144.20	149.70	155.20	159.90	164.50	165.50
12.0–12.49 years	153.19	7.48	138.20	141.00	143.90	148.10	153.40	158.40	162.80	165.70	167.00
12.5–12.99 years	156.26	6.89	143.00	144.60	147.50	151.90	156.50	160.70	165.00	166.30	168.40
13.0–13.49 years	158.70	6.80	145.10	147.50	150.00	154.40	158.90	163.20	166.70	169.50	170.40
13.5–13.99 years	159.36	6.33	147.60	149.50	150.90	155.50	159.30	163.20	167.00	169.90	172.30
14.0–14.49 years	160.73	6.40	149.80	150.80	152.60	156.30	161.00	165.00	169.40	171.90	172.70
14.5–14.99 years	161.35	6.74	148.40	150.20	152.80	156.70	161.60	166.20	169.90	172.40	174.10

Table 15. Observed mean, standard deviation, and selected percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	Mean	Standard deviation	Percentile								
			3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.											
15.0–15.49 years	162.34	6.37	150.90	151.90	154.20	158.30	162.20	166.50	170.60	173.50	176.00
15.5–15.99 years	163.61	6.32	151.70	153.10	155.40	159.20	164.00	167.80	171.20	173.90	175.50
16.0–16.49 years	162.73	6.16	151.20	151.90	155.20	158.50	162.80	166.40	171.20	172.60	174.30
16.5–16.99 years	162.37	6.45	150.10	151.60	154.40	158.30	162.50	166.40	170.90	173.00	174.20
17.0–17.49 years	162.83	6.64	151.40	153.20	155.00	158.40	162.20	167.00	171.90	174.00	176.30
17.5–17.99 years	163.10	6.15	150.30	151.80	154.90	159.30	163.30	167.00	171.00	172.80	175.60
18.0–18.49 years	163.82	6.77	151.50	153.70	155.30	159.40	164.30	167.50	172.60	174.90	177.00
18.5–18.99 years	163.27	6.24	150.30	152.40	154.90	159.10	163.70	167.00	170.70	173.60	174.20
19.0–19.49 years	163.30	5.55	151.20	153.30	156.20	160.20	163.50	167.30	169.70	171.70	172.80
19.5–19.99 years	163.33	6.29	151.90	154.20	155.30	158.60	163.50	167.40	171.70	174.00	175.90

Table 16. Observed mean, standard deviation, and selected percentiles for body mass index (kilograms/meter^2) by sex and age: 2 to 20 years

Sex and age	Mean	Standard deviation	Percentile									
			3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys												
2–2.49 years	16.54	1.29	14.48	14.73	15.08	15.56	16.38	17.26	17.79	18.15	18.85	19.37
2.5–2.99 years	16.17	1.20	13.98	14.32	14.64	15.37	16.16	16.96	17.37	17.67	18.28	18.57
3.0–3.49 years	16.04	1.24	13.80	14.13	14.60	15.21	15.88	16.90	17.29	17.71	18.31	18.60
3.5–3.99 years	15.92	1.39	13.90	14.18	14.42	15.05	15.82	16.50	17.06	17.36	18.12	18.70
4.0–4.49 years	15.86	1.39	13.72	13.94	14.28	15.03	15.75	16.55	17.06	17.43	17.92	18.67
4.5–4.99 years	15.73	1.34	13.57	13.92	14.29	14.92	15.65	16.42	16.84	17.09	17.82	18.11
5.0–5.49 years	15.79	1.60	13.66	13.85	14.29	14.81	15.62	16.36	16.87	17.36	18.08	20.27
5.5–5.99 years	15.72	1.65	13.64	13.82	14.11	14.72	15.48	16.38	17.06	17.41	18.53	19.15
6.0–6.49 years	15.61	1.61	13.41	13.72	14.18	14.72	15.37	16.24	16.81	17.18	18.12	18.99
6.5–6.99 years	15.90	1.95	13.43	13.73	14.05	14.59	15.49	16.72	17.49	18.07	19.09	20.40
7.0–7.49 years	15.80	1.72	13.06	13.43	13.98	14.73	15.62	16.48	17.17	17.67	18.79	19.45
7.5–7.99 years	16.00	1.74	13.65	13.90	14.19	14.97	15.60	16.68	17.39	18.04	19.62	20.03
8.0–8.49 years	16.06	1.98	13.25	13.57	14.19	14.81	15.68	16.74	17.71	18.28	19.71	20.85
8.5–8.99 years	16.42	2.24	13.62	14.10	14.48	15.13	16.06	17.10	18.02	18.96	19.68	20.57
9.0–9.49 years	16.84	2.62	13.74	14.00	14.29	14.99	16.13	17.71	19.64	20.40	22.29	23.09
9.5–9.99 years	17.03	2.77	13.63	13.98	14.59	15.37	16.35	17.87	19.29	19.94	21.78	23.84
10.0–10.49 years	17.20	2.37	14.19	14.54	14.87	15.59	16.70	18.28	19.36	20.08	22.03	23.15
10.5–10.99 years	17.76	2.88	14.39	14.59	14.96	15.78	17.17	18.81	19.95	21.16	24.16	25.96
11.0–11.49 years	17.98	2.91	14.40	14.77	15.27	16.10	17.31	18.97	20.87	21.69	23.05	24.99
11.5–11.99 years	18.39	3.76	14.31	14.72	15.10	16.07	17.26	19.80	21.61	23.67	26.04	27.12
12.0–12.49 years	18.48	2.95	14.67	15.03	15.63	16.57	17.74	19.61	21.02	22.28	24.20	26.90
12.5–12.99 years	18.70	3.05	14.83	15.22	15.88	16.80	17.96	19.95	21.19	22.41	24.96	25.80
13.0–13.49 years	19.11	3.14	15.28	15.54	16.09	17.02	18.32	20.56	21.85	22.81	25.12	27.79
13.5–13.99 years	19.89	3.73	15.42	16.02	16.57	17.63	18.97	21.02	23.45	24.80	26.66	27.32
14.0–14.49 years	19.87	3.09	15.69	16.14	16.79	17.85	19.27	21.04	22.68	23.69	25.29	26.36
14.5–14.99 years	20.51	3.35	16.20	16.53	17.18	18.24	19.78	21.87	23.64	24.92	27.38	28.07
15.0–15.49 years	20.50	3.12	16.29	16.58	17.35	18.52	19.81	21.77	23.51	24.14	25.69	27.75
15.5–15.99 years	21.01	3.24	16.48	16.80	17.73	19.11	20.47	22.29	23.54	24.81	27.08	29.21
16.0–16.49 years	21.48	3.25	17.37	17.59	18.37	19.48	20.83	22.45	23.88	25.93	27.93	30.23
16.5–16.99 years	21.97	3.28	17.31	17.76	18.42	19.57	21.69	23.47	24.82	25.72	27.59	29.00
17.0–17.49 years	21.84	3.46	16.96	17.80	18.37	19.54	21.02	23.44	24.86	26.29	28.83	29.63
17.5–17.99 years	21.96	3.36	17.50	18.03	18.66	19.70	21.27	23.56	25.11	26.17	28.06	30.27
18.0–18.49 years	23.22	4.12	17.79	18.11	18.86	20.39	22.45	24.56	26.57	28.41	31.43	33.16
18.5–18.99 years	22.89	3.53	17.52	18.69	19.06	20.64	22.36	24.38	26.20	27.69	28.70	30.40
19.0–19.49 years	23.31	3.28	18.99	19.17	19.72	21.06	22.95	24.68	26.16	28.06	30.79	31.44
19.5–19.99 years	23.16	3.85	18.02	18.04	19.18	20.99	22.53	24.27	26.80	28.99	30.73	32.14
Girls												
2–2.49 years	16.26	1.51	14.15	14.32	14.66	15.34	16.09	17.05	17.60	18.04	18.61	19.13
2.5–2.99 years	16.09	1.41	13.81	14.13	14.48	15.18	15.99	16.79	17.31	17.69	18.25	18.69
3.0–3.49 years	15.92	1.55	13.62	13.80	14.27	14.99	15.76	16.57	17.33	17.64	18.42	18.83
3.5–3.99 years	15.63	1.41	13.49	13.58	13.88	14.66	15.55	16.44	16.88	17.27	17.84	18.52
4.0–4.49 years	15.72	1.54	13.51	13.71	14.10	14.75	15.52	16.39	16.98	17.49	18.53	18.91
4.5–4.99 years	15.63	2.05	13.34	13.67	13.92	14.48	15.35	16.20	16.75	17.23	18.27	19.08
5.0–5.49 years	15.64	1.81	13.24	13.47	13.80	14.45	15.33	16.46	17.08	17.72	19.36	19.73
5.5–5.99 years	15.78	2.02	13.18	13.46	13.77	14.52	15.27	16.56	17.54	18.77	19.98	20.31
6.0–6.49 years	15.48	1.70	13.07	13.46	13.90	14.34	15.22	16.23	16.88	17.28	18.34	19.32
6.5–6.99 years	15.49	1.78	13.17	13.36	13.63	14.29	15.13	16.24	17.16	17.71	18.74	19.66
7.0–7.49 years	15.70	1.80	13.00	13.56	13.87	14.51	15.37	16.52	17.18	17.81	19.22	19.95
7.5–7.99 years	15.89	2.06	13.28	13.64	13.84	14.60	15.39	16.72	17.80	18.51	19.66	21.44
8.0–8.49 years	16.19	2.07	13.40	13.61	14.06	14.78	15.71	17.31	18.30	18.90	19.90	21.61
8.5–8.99 years	16.56	2.68	13.47	13.76	14.22	14.91	15.83	17.48	18.63	19.71	21.54	23.10
9.0–9.49 years	17.02	2.66	13.79	14.09	14.46	15.19	16.33	18.13	19.04	20.10	22.88	24.25
9.5–9.99 years	17.41	3.05	13.71	13.96	14.70	15.58	16.53	18.31	20.18	21.26	23.29	25.54
10.0–10.49 years	17.31	2.87	13.50	13.80	14.27	15.41	16.66	18.51	19.93	20.99	23.18	23.78
10.5–10.99 years	17.56	2.81	13.89	14.09	14.74	15.72	17.03	18.61	20.04	21.78	23.35	24.03
11.0–11.49 years	18.35	3.24	13.94	14.45	14.91	16.16	17.87	20.00	21.38	22.43	24.71	26.99
11.5–11.99 years	18.80	3.59	13.86	14.39	15.20	16.23	18.36	20.34	22.01	23.08	25.76	27.53
12.0–12.49 years	18.99	3.28	14.62	14.77	15.49	16.60	18.41	20.75	22.00	22.74	25.10	27.12
12.5–12.99 years	19.63	3.59	14.95	15.19	15.81	17.24	18.77	21.28	23.58	24.70	26.59	28.01
13.0–13.49 years	19.96	3.80	15.07	15.42	16.13	17.47	18.96	21.55	23.37	24.39	28.47	30.26
13.5–13.99 years	20.37	3.95	14.80	15.60	16.32	17.77	19.62	21.96	23.71	24.76	27.83	30.03
14.0–14.49 years	20.75	3.95	16.05	16.39	16.75	18.04	19.77	22.37	24.62	25.76	29.13	32.17
14.5–14.99 years	21.17	3.68	16.27	16.68	17.48	18.51	20.47	22.83	24.52	25.89	27.69	29.43

Table 16. Observed mean, standard deviation, and selected percentiles for body mass index (kilograms/meter^2) by sex and age: 2 to 20 years—Con.

Sex and age	Mean	Standard deviation	Percentile									
			3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Girls—Con.												
15.0–15.49 years	20.90	3.63	16.53	16.77	17.37	18.51	20.03	22.29	24.01	25.57	28.54	29.85
15.5–15.99 years	21.19	3.55	16.75	17.19	17.59	19.06	20.43	22.47	23.86	25.02	27.14	30.18
16.0–16.49 years	21.66	3.87	16.97	17.71	18.22	19.10	20.62	22.83	25.70	26.46	29.68	31.77
16.5–16.99 years	21.91	3.97	17.17	17.65	18.17	19.31	21.05	23.39	25.22	26.50	29.33	32.19
17.0–17.49 years	21.98	4.51	16.77	17.11	17.61	19.20	21.08	23.59	25.15	26.88	30.27	32.29
17.5–17.99 years	22.53	4.31	17.41	17.92	18.71	19.89	21.71	23.90	25.41	26.80	30.27	33.63
18.0–18.49 years	21.94	4.16	16.44	16.59	18.36	19.55	20.99	23.28	24.45	26.22	32.55	34.02
18.5–18.99 years	21.80	3.28	16.70	17.58	18.21	19.28	21.60	23.66	24.32	26.00	28.88	28.88
19.0–19.49 years	22.03	4.14	16.79	17.71	18.08	19.03	21.46	23.66	25.65	27.22	28.98	31.46
19.5–19.99 years	23.03	4.72	18.29	18.67	19.19	20.31	21.69	24.13	25.99	29.34	32.51	33.89

Table 17. *L, M,* and *S,* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: Birth to 36 months

Sex and age	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
Birth	1.815151075	3.530203168	0.152385273	2.355450986	2.52690402	2.773801848	3.150611082	3.530203168	3.879076559	4.17249339	4.34029274	4.446488308
0–0.99 months	1.547523128	4.003106424	0.146025021	2.799548641	2.964655655	3.209510017	3.597395573	4.003106424	4.387422565	4.718161283	4.910130108	5.032624982
1–1.99 months	1.068795548	4.879525083	0.136478767	3.614688072	3.774848862	4.020561446	4.428872952	4.879525083	5.327327567	5.728152752	5.967101615	6.121929103
2–2.99 months	0.695973505	5.672888765	0.129677511	4.34234145	4.503255345	4.754479354	5.183377547	5.672888765	6.175598158	6.638979132	6.921119162	7.106250132
3–3.99 months	0.41981509	6.391391982	0.124717085	4.992897896	5.157411653	5.416802856	5.866806254	6.391391982	6.942217106	7.460702368	7.781401145	7.993878049
4–4.99 months	0.219866801	7.041836432	0.121040119	5.575169066	5.744751566	6.01371624	6.484969167	7.041836432	7.635323002	8.202193202	8.556813353	8.793443663
5–5.99 months	0.077505598	7.630425182	0.1182712	6.096775274	6.272175299	6.551379244	7.043626918	7.630425182	8.262032991	8.871384112	9.255614546	9.51330656
6–6.99 months	–0.02190761	8.162951035	0.116153695	6.564430346	6.745992665	7.035656404	7.548345716	8.162951035	8.828786159	9.47546616	9.885435743	10.16135019
7–7.99 months	–0.0894409	8.644832479	0.114510349	6.984123338	7.171952393	7.472021438	8.004398775	8.644832479	9.34149038	10.02101374	10.45331433	10.74492376
8–8.99 months	–0.1334091	9.081119817	0.113217163	7.361236116	7.555286752	7.865532922	8.416718775	9.081119817	9.805593364	10.51406421	10.96573632	11.27083843
9–9.99 months	–0.1600954	9.476500305	0.11218624	7.700624405	7.90075516	8.220839211	8.789881892	9.476500305	10.22612395	10.96017225	11.42867623	11.74538465
10–10.99 months	–0.17429685	9.835307701	0.111354536	8.006677447	8.212683538	8.542195484	9.128109523	9.835307701	10.60772151	11.36445045	11.84763282	12.17435729
11–11.99 months	–0.1797189	10.16153567	0.110676413	8.283364855	8.494999555	8.833485623	9.43527941	10.16153567	10.9546603	11.73160184	12.2276612	12.56308347
12–12.99 months	–0.179254	10.45885399	0.110118635	8.534275028	8.751264252	9.098245709	9.714941801	10.45885399	11.27087147	12.06594792	12.57340193	12.91645043
13–13.99 months	–0.17518447	10.7306256	0.109656941	8.762648582	8.984701111	9.339687673	9.970337596	10.7306256	11.55996332	12.37145331	12.88910809	13.23893338
14–14.99 months	–0.16932268	10.97992482	0.109273653	8.971407287	9.198222429	9.560722369	10.20441778	10.97992482	11.82524099	12.65174864	13.17867019	13.53462171
15–15.99 months	–0.1631139	11.20955529	0.10895596	9.163180317	9.394453831	9.763981751	10.41986276	11.20955529	12.06972515	12.91015164	13.44563963	13.80724431
16–16.99 months	–0.15770999	11.4220677	0.108694678	9.340328068	9.575756968	9.951839998	10.61910138	11.4220677	12.29616991	13.14968707	13.6932508	14.0601935
17–17.99 months	–0.15402279	11.61977698	0.108483324	9.504964014	9.744250626	10.12643352	10.80432929	11.61977698	12.50708008	13.37310558	13.92444193	14.29654774
18–18.99 months	–0.15276214	11.80477902	0.108317416	9.658974787	9.901830339	10.28967982	10.97752662	11.80477902	12.70472779	13.58290165	14.14187481	14.51909298
19–19.99 months	–0.15446658	11.9789663	0.108193944	9.804039109	10.05018686	10.44329524	11.14047457	11.9789663	12.89116805	13.78133058	14.34795358	14.73034312
20–20.99 months	–0.15952202	12.14404334	0.108110954	9.941644878	10.19082308	10.58881155	11.2947714	12.14404334	13.06825426	13.9704249	14.54484233	14.93255878
21–21.99 months	–0.16817926	12.30154103	0.108067236	10.07310549	10.32507004	10.72759156	11.44184727	12.30154103	13.23765258	14.15200982	14.73448194	15.12776542
22–22.99 months	–0.1805668	12.45283028	0.108062078	10.19957488	10.45410181	10.86084353	11.58297823	12.45283028	13.40085582	14.3277181	14.91860604	15.31777023
23–23.99 months	–0.19670196	12.59913494	0.108095077	10.32206165	10.57894925	10.98963476	11.7192993	12.59913494	13.55919667	14.49900418	15.09875606	15.50417803
24–24.99 months	–0.21650121	12.74154396	0.108166005	10.4414422	10.70051298	11.11490406	11.85181666	12.74154396	13.71386029	14.6671577	15.27629562	15.68840631
25–25.99 months	–0.23979048	12.88102276	0.108274705	10.55847309	10.81957536	11.23747341	11.98141892	12.88102276	13.86589625	14.83331632	15.45242405	15.87169941
26–26.99 months	–0.26631585	13.01842382	0.108421024	10.67380261	10.93681171	11.35805876	12.10888759	13.01842382	14.0162298	14.99847794	15.62818936	16.05514188
27–27.99 months	–0.29575496	13.1544966	0.108604769	10.78798156	11.05280067	11.47727994	12.23490671	13.1544966	14.1656725	15.16351231	15.80450043	16.23967114
28–28.99 months	–0.32772936	13.28989667	0.108825681	10.90147346	11.168034	11.59566994	12.36007175	13.28989667	14.31493214	15.32917196	15.98213866	16.42608957
29–29.99 months	–0.36181746	13.42519408	0.109083423	11.01466395	11.28292555	11.7136834	12.48489772	13.42519408	14.46462206	15.49610261	16.16176896	16.61507584
30–30.99 months	–0.39756808	13.56088113	0.109377581	11.12786972	11.3978197	11.8317045	12.60982671	13.56088113	14.61526973	15.66485286	16.34395024	16.80719582
31–31.99 months	–0.43452025	13.69737858	0.109707646	11.24134752	11.51299966	11.95005435	12.73523417	13.69737858	14.76732387	15.83588308	16.52914562	17.00291386
32–32.99 months	–0.47218875	13.83504622	0.110073084	11.3552982	11.62869248	12.06899744	12.86143776	13.83504622	14.9211657	16.00957526	16.71773017	17.2025984
33–33.99 months	–0.51012309	13.97418199	0.110473238	11.46987977	11.74507947	12.18874835	12.98869905	13.97418199	15.07710916	16.18623873	16.91000241	17.40653835
34–34.99 months	–0.54788557	14.1150324	0.1109074	11.58520959	11.86229971	12.30947723	13.11723187	14.1150324	15.23541179	16.36611917	17.10619066	17.61494698
35–35.99 months	–0.5850701	14.25779618	0.111374787	11.70137143	11.98045644	12.43131521	13.24720657	14.25779618	15.3962791	16.54940494	17.30646132	17.8279717
Girls												
Birth	1.509187507	3.39918645	0.142106724	2.414111983	2.54790518	2.747222257	3.06486465	3.39918645	3.717519384	3.992572231	4.152636594	4.254922004
0–0.99 months	1.357944315	3.79752846	0.138075916	2.756916984	2.894442278	3.101767067	3.437628263	3.79752846	4.145593668	4.450125603	4.628836382	4.743581789
1–1.99 months	1.105537708	4.544776513	0.131733888	3.402293298	3.547610305	3.770157472	4.13899376	4.544776513	4.946765504	5.305632496	5.51916925	5.657379108
2–2.99 months	0.902596648	5.230584214	0.126892697	3.997805608	4.150638506	4.387041982	4.784820426	5.230584214	5.680083196	6.08764077	6.332837055	6.492574414
3–3.99 months	0.734121414	5.859960798	0.123025182	4.54738333	4.70712251	4.95592631	5.379141034	5.859960798	6.351511983	6.802769825	7.076722522	7.256165568
4–4.99 months	0.590235275	6.437587751	0.119840911	5.054538727	5.220487543	5.480295205	5.92588831	6.437587751	6.966523789	7.45711879	7.757233948	7.954730061
5–5.99 months	0.464391566	6.967850457	0.117166868	5.522500226	5.693974176	5.963510428	6.428828208	6.967850457	7.53018045	8.056331004	8.380329759	8.59441348
6–6.99 months	0.352164071	7.454854109	0.11489384	5.954272494	6.130641295	6.408775097	6.891533095	7.454854109	8.047178246	8.605635546	8.951543685	9.180938407
7–7.99 months	0.250497889	7.902436186	0.112949644	6.352668277	6.533372908	6.819122283	7.317373091	7.902436186	8.52187726	9.109878097	9.476008728	9.719620693

Table 17. *L, M,* and *S,* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: Birth to 36 months—Con.

Sex and age	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
8–8.99 months	0.15724751	8.314178377	0.11128469	6.720327734	6.904885578	7.197413532	7.709516114	8.314178377	8.958324062	9.573546299	9.958479736	10.2153883
9–9.99 months	0.070885725	8.693418423	0.109863709	7.059731719	7.247735767	7.546341788	8.070932165	8.693418423	9.360270982	10.00079194	10.40335475	10.67280092
10–10.99 months	–0.00968493	9.043261854	0.10866078	7.373211901	7.564326904	7.868436369	8.404399764	9.043261854	9.7311934	10.3954511	10.81469528	11.0960696
11–11.99 months	–0.085258	9.366593571	0.10765621	7.662959063	7.856916169	8.166068895	8.712513432	9.366593571	10.07430572	10.76106284	11.19624565	11.48907597
12–12.99 months	–0.15640945	9.666089185	0.106834517	7.93103031	8.127621012	8.441459662	8.997691667	9.666089185	10.39257636	11.10088678	11.5514514	11.85539095
13–13.99 months	–0.22355869	9.944226063	0.106183085	8.179355552	8.378425424	8.696684147	9.262185089	9.944226063	10.68874201	11.4179197	11.88347697	12.19829279
14–14.99 months	–0.28701346	10.20329397	0.105691242	8.409743555	8.611186014	8.933679535	9.508084539	10.20329397	10.96532105	11.7149113	12.19522253	12.52078451
15–15.99 months	–0.34699919	10.4454058	0.105349631	8.62388725	8.827637666	9.154251142	9.737329319	10.4454058	11.2246268	11.99437938	12.48934	12.82561033
16–16.99 months	–0.40368918	10.67250698	0.105149754	8.82336957	9.029399482	9.360078736	9.951714686	10.67250698	11.46877937	12.258624	12.76824867	13.11527219
17–17.99 months	–0.45721877	10.88638558	0.105083666	9.00966812	9.217979979	9.55272268	10.15289979	10.88638558	11.69971783	12.50974133	13.03414978	13.39204468
18–18.99 months	–0.50770077	11.08868151	0.105143752	9.184160166	9.394782429	9.733629905	10.34241498	11.08868151	11.91921144	12.74963667	13.28904061	13.65798985
19–19.99 months	–0.55523599	11.28089537	0.105322575	9.348127323	9.561109949	9.904139709	10.52166904	11.28089537	12.1288704	12.98003694	13.53472797	13.91497124
20–20.99 months	–0.59992113	11.46439708	0.10561278	9.502760074	9.718170424	10.06548937	10.69195601	11.46439708	12.3301562	13.20250263	13.77284102	14.1646673
21–21.99 months	–0.64185418	11.64043402	0.106007025	9.649162144	9.867081272	10.21881956	10.85446195	11.64043402	12.52439148	13.41843913	14.00484351	14.40858419
22–22.99 months	–0.6811381	11.81013895	0.106497957	9.788354721	10.00887405	10.3651796	11.01027128	11.81013895	12.71276942	13.62910755	14.23204547	14.64806798
23–23.99 months	–0.71788283	11.97453748	0.107078197	9.921280547	10.14449891	10.50553251	11.16037297	11.97453748	12.89636272	13.8356351	14.45561433	14.88431632
24–24.99 months	–0.75220617	12.13455528	0.107740346	10.04880788	10.27482891	10.64075987	11.30566645	12.13455528	13.07613212	14.03902484	14.67658549	15.11838945
25–25.99 months	–0.78423359	12.2910249	0.108477009	10.17173431	10.40066414	10.77166654	11.44696728	12.2910249	13.25293459	14.24016506	14.89587242	15.35122083
26–26.99 months	–0.81409743	12.44469237	0.109280822	10.29079052	10.52273581	10.89898515	11.58501256	12.44469237	13.42753102	14.43983817	15.11427618	15.5836271
27–27.99 months	–0.8419355	12.59622335	0.110144488	10.40664383	10.64171007	11.02338047	11.72046615	12.59622335	13.60059358	14.63872906	15.33249457	15.8163176
28–28.99 months	–0.86788939	12.74620911	0.111060814	10.51990171	10.7581918	11.14545358	11.8539236	12.74620911	13.77271274	14.83743314	15.55113065	16.0499034
29–29.99 months	–0.89210264	12.89517218	0.112022758	10.63111516	10.8727282	11.26574591	11.98591692	12.89517218	13.94440383	15.03646393	15.770701	16.28490586
30–30.99 months	–0.91471881	13.04357164	0.113023466	10.74078194	10.98581228	11.38474303	12.11691911	13.04357164	14.11611337	15.23626013	15.99164336	16.52176469
31–31.99 months	–0.93587966	13.19180827	0.114056316	10.84934975	11.09788625	11.50287842	12.24734843	13.19180827	14.28822496	15.43719248	16.21432393	16.7608456
32–32.99 months	–0.95572344	13.34022934	0.115114952	10.95721927	11.2093447	11.62053697	12.37757256	13.34022934	14.46106492	15.63957012	16.43904429	17.00244749
33–33.99 months	–0.97438101	13.48913357	0.116193337	11.06474677	11.32053756	11.73805834	12.50791269	13.48913357	14.634908	15.84364677	16.66604772	17.24680884
34–34.99 months	–0.99198075	13.63877446	0.11728575	11.17224778	11.43177357	11.85574032	12.63864672	13.63877446	14.80998135	16.04962601	16.89552564	17.49411514
35–35.99 months	–1.00864074	13.78936547	0.118386847	11.27999893	11.54332263	11.9738418	12.77001339	13.78936547	14.98647034	16.25766706	17.12762297	17.74450372

Table 18. *L, M,* and *S,* parameters and selected smoothed percentiles for recumbent length (in centimeters) by sex and age: Birth to 36 months

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
Birth	1.267004226	49.98888408	0.053112191	45.00612553	45.63915075	46.60925664	48.218174	49.98888408	51.74273158	53.30756232	54.23810497	54.84011528
0–0.99 months	0.511237696	52.6959753	0.048692684	48.04973769	48.6209095	49.506962	51.00525369	52.6959753	54.41405653	55.98376034	56.9337518	57.55495075
1–1.99 months	–0.45224446	56.62842855	0.04411683	52.26116691	52.781234	53.59708281	55.00240616	56.62842855	58.32626315	59.91924919	60.90339687	61.55532574
2–2.99 months	–0.990594599	59.60895343	0.041795583	55.32153252	55.82492468	56.61840131	57.99633728	59.60895343	61.31467574	62.93631975	63.94885006	64.62419672
3–3.99 months	–1.285837689	62.07700027	0.040454126	57.78649885	58.28692327	59.07746094	60.45550522	62.07700027	63.80289207	65.45448755	66.49126189	67.18521797
4–4.99 months	–1.43031238	64.2168641	0.039633879	59.88038198	60.38480884	61.18237422	62.57480445	64.2168641	65.96919935	67.65073205	68.70871502	69.41794083
5–5.99 months	–1.47657547	66.1253149	0.039123813	61.71780444	62.23030651	63.04073288	64.45590909	66.1253149	67.90752029	69.61844727	70.69531881	71.4173861
6–6.99 months	–1.456837849	67.8601799	0.038811994	63.36584892	63.889034	64.71604295	66.15925026	67.8601799	69.67415303	71.4137019	72.50762781	73.24070888
7–7.99 months	–1.391898768	69.45908458	0.038633209	64.86744574	65.40309649	66.24921112	67.72396873	69.45908458	71.30583396	73.07313903	74.18263173	74.92531457
8–8.99 months	–1.29571459	70.94803912	0.038546833	66.25187348	66.80126999	67.66827946	69.17701631	70.94803912	72.82802797	74.62219816	75.74602764	76.49719914
9–9.99 months	–1.177919048	72.34586111	0.038526262	67.54007513	68.10417305	68.99339048	70.53782479	72.34586111	74.25920575	76.07935957	77.21649287	77.97526103
10–10.99 months	–1.045326049	73.6666541	0.038553387	68.7475992	69.32713403	70.23954867	71.82091411	73.6666541	75.61324507	77.45852984	78.60808958	79.37373061
11–11.99 months	–0.902800887	74.92129717	0.038615501	69.88633417	70.48188777	71.41826211	73.03745271	74.92129717	76.90087558	78.77047479	79.93170629	80.7036248
12–12.99 months	–0.753908107	76.11837536	0.038703461	70.96559835	71.57764016	72.53857067	74.19623275	76.11837536	78.13058376	80.02372308	81.19597313	81.97367578
13–13.99 months	–0.601263523	77.26479911	0.038810557	71.99284334	72.62175913	73.60771866	75.30431489	77.26479911	79.30921541	81.22516353	82.40786231	83.19093672
14–14.99 months	–0.446805039	78.36622309	0.038931784	72.97413192	73.6202435	74.63161045	76.36746432	78.36622309	80.44238393	82.38045224	83.57309961	84.36119864
15–15.99 months	–0.291974772	79.4273405	0.039063356	73.91447032	74.57804959	75.61512873	77.39045632	79.4273405	81.53475764	83.4942989	84.69645352	85.48928313
16–16.99 months	–0.13784767	80.45209492	0.039202382	74.81804561	75.49932478	76.56236246	78.37729583	80.45209492	82.59026676	84.57067327	85.78194386	86.57925367
17–17.99 months	0.014776155	81.44383603	0.039346629	75.68839929	76.38757841	77.4767739	79.33137846	81.44383603	83.6122559	85.61295738	86.83299553	87.63457134
18–18.99 months	0.165304169	82.40543643	0.039494365	76.52855656	77.2458093	78.36132336	80.25561111	82.40543643	84.60359846	86.62405981	87.85255417	88.65821192
19–19.99 months	0.313301809	83.33938063	0.039644238	77.3411245	78.07660252	79.21856401	81.15250374	83.33938063	85.56678396	87.60650304	88.84317438	89.65275537
20–20.99 months	0.458455471	84.24783394	0.039795189	78.12836755	78.88220395	80.05071504	82.02424031	84.24783394	86.50398577	88.5624912	89.80708833	90.62045524
21–21.99 months	0.600544631	85.13269658	0.039946388	78.8922666	79.66457861	80.85971886	82.87273432	85.13269658	87.4171142	89.49396332	90.7462596	91.56329326
22–22.99 months	0.739438953	85.9956488	0.040097181	79.63456346	80.42545568	81.64728665	83.69967461	85.9956488	88.30786055	90.40263591	91.66242499	92.48302068
23–23.99 months	0.875000447	86.8381751	0.04024706	80.35680765	81.16637022	82.41493357	84.50655294	86.8381751	89.1777232	91.29003583	92.55713369	93.38120251
24–24.99 months	1.00720807	87.66160934	0.040395626	81.06037074	81.88868489	83.16400989	85.29470553	87.66160934	90.02804829	92.15753004	93.43176749	94.25923029
25–25.99 months	0.837251351	88.45247282	0.040577525	81.8052937	82.63445202	83.91387064	86.05887745	88.45247282	90.85675457	93.02966054	94.33406648	95.18278047
26–26.99 months	0.681492975	89.22326434	0.040723122	82.5341574	83.36406112	84.64716151	86.8051731	89.22326434	91.6626041	93.87608163	95.20884914	96.07761711
27–27.99 months	0.538779654	89.97549228	0.040833194	83.24845648	84.07898582	85.36534433	87.53506945	89.97549228	92.44711353	94.69827114	96.05754106	96.94511823
28–28.99 months	0.407697153	90.71040853	0.040909059	83.94944982	84.78045262	86.06961974	88.24977223	90.71040853	93.21159029	95.49757027	96.88148848	97.78662531
29–29.99 months	0.286762453	91.42907762	0.040952433	84.63819399	85.46948449	86.76098331	88.95028421	91.42907762	93.95718995	96.27522083	97.68197981	98.6034532
30–30.99 months	0.174489485	92.13242379	0.04096533	85.31558277	86.1469433	87.44027154	89.63745411	92.13242379	94.68495599	97.03239427	98.46026663	99.39690538
31–31.99 months	0.069444521	92.82127167	0.040949976	85.98238019	86.81356554	88.10820085	90.3120186	92.82127167	95.39585394	97.77021533	99.2175791	100.1682833
32–32.99 months	–0.029720564	93.49637946	0.040908737	86.63925011	87.46999332	88.76540055	90.97463683	93.49637946	96.09079906	98.48978097	99.95513792	100.9188932
33–33.99 months	–0.124251789	94.15846546	0.040844062	87.28678276	88.11680155	89.41244073	91.62591867	94.15846546	96.77067824	99.19217521	100.6741635	101.6500508
34–34.99 months	–0.215288396	94.80822923	0.040758431	87.92551862	88.75452162	90.04985581	92.26644774	94.80822923	97.43636727	99.8784807	101.3758831	102.3630853
35–35.99 months	–0.30385434	95.44636981	0.040654312	88.55596799	89.38366128	90.67816458	92.89680119	95.44636981	98.08874542	100.5497877	102.0615351	103.0593402
Girls												
Birth	–1.295960857	49.28639612	0.05008556	45.16290983	45.63583839	46.38717056	47.70947448	49.28639612	50.99057602	52.64705428	53.70008709	54.41073727
0–0.99 months	–0.809249882	51.68358057	0.046818545	47.5343839	48.0208249	48.78800472	50.12141713	51.68358057	53.33761678	54.91147535	55.89473554	56.55076942
1–1.99 months	–0.050782985	55.28612813	0.0434439	51.01964	51.53503149	52.33953078	53.71386774	55.28612813	56.90755246	58.41025523	59.32973811	59.93512871
2–2.99 months	0.476851407	58.09381906	0.041716103	53.69072443	54.23298148	55.07361272	56.49359771	58.09381906	59.71777002	61.19969178	62.09577757	62.68142294
3–3.99 months	0.843299612	60.45980763	0.040705173	55.92026196	56.48662578	57.36048247	58.82538022	60.45980763	62.10128248	63.58457922	64.47491479	65.05417552
4–4.99 months	1.097562257	62.53669656	0.040079765	57.86522501	58.4532373	59.3575223	60.86551938	62.53669656	64.20347124	65.69997036	66.59395216	67.17389743
5–5.99 months	1.272509641	64.40632762	0.039686845	59.60832861	60.21593325	61.14823459	62.69739258	64.40632762	66.10283931	67.61954037	68.52274397	69.10755723
6–6.99 months	1.390428859	66.11841553	0.039444555	61.19916978	61.82466699	62.78295251	64.37145135	66.11841553	67.84732266	69.38863359	70.30459957	70.89693895
7–7.99 months	1.466733925	67.70574419	0.039304738	62.67013206	63.31211299	64.2946723	65.92086464	67.70574419	69.46866839	71.03747474	71.96855522	72.5701931

Table 18. *L, M,* and *S,* parameters and selected smoothed percentiles for recumbent length (in centimeters) by sex and age: Birth to 36 months—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
8–8.99 months	1.512301976	69.19123614	0.03923711	64.04368248	64.70097098	65.70635581	67.3687658	69.19123614	70.9891564	72.5873908	73.53519665	74.14735522
9–9.99 months	1.534950767	70.59163924	0.039221665	65.33613405	66.0077396	67.03471346	68.73201986	70.59163924	72.42511841	74.05408822	75.01974455	75.64328643
10–10.99 months	1.540390875	71.91961673	0.039244672	66.55975865	67.24483959	68.29233743	70.02335386	71.91961673	73.7889394	75.44952668	76.43382785	77.06937115
11–11.99 months	1.532852892	73.1850104	0.03929642	67.7240539	68.42188876	69.48898529	71.25264177	73.1850104	75.09027076	76.78305993	77.78656813	78.43455934
12–12.99 months	1.51550947	74.39564379	0.039369875	68.8365432	69.54650838	70.6323931	72.42771996	74.39564379	76.33680358	78.06216608	79.08527641	79.74603843
13–13.99 months	1.490765028	75.5578544	0.039459832	69.9033028	70.62485507	71.72881264	73.55492682	75.5578544	77.53478229	79.29293439	80.33591931	81.00968409
14–14.99 months	1.460458255	76.67685871	0.039562382	70.92932142	71.66198409	72.78337866	74.63947222	76.67685871	78.68935763	80.480401	81.54344138	82.2303728
15–15.99 months	1.426006009	77.75700986	0.039674542	71.91875303	72.66210489	73.8003676	75.6856981	77.75700986	79.80483633	81.62878705	82.7119945	83.41220466
16–16.99 months	1.388507095	78.80198406	0.03979401	72.87509898	73.6287655	74.78338431	76.69726669	78.80198406	80.88486219	82.74167188	83.84510502	84.55866622
17–17.99 months	1.348818127	79.81491852	0.039918994	73.80134232	74.56498844	75.73549992	77.67729966	79.81491852	81.9325501	83.82212167	84.94579817	85.67275177
18–18.99 months	1.307609654	80.79851532	0.040048084	74.70004853	75.47337286	76.6593554	78.62848273	80.79851532	82.9505873	84.87278665	86.01669241	86.75705551
19–19.99 months	1.265408149	81.75512092	0.040180162	75.57344266	76.35617266	77.55724085	79.55314579	81.75512092	83.94131098	85.89597597	87.06007202	87.81384263
20–20.99 months	1.222627732	82.6867881	0.04031434	76.42346895	77.21535696	78.43115695	80.45332508	82.6867881	84.90676875	86.89371606	88.07794398	88.84510488
21–21.99 months	1.179594365	83.59532461	0.040449904	77.25183786	78.05265781	79.28286338	81.33081218	83.59532461	85.84876629	87.86779673	89.07208283	89.85260475
22–22.99 months	1.136564448	84.48233206	0.040586283	78.06006336	78.86960798	80.11391724	82.18719293	84.48233206	86.76890547	88.81980812	90.0440667	90.83791074
23–23.99 months	1.093731947	85.34923624	0.040723015	78.84949387	79.66757195	80.92570398	83.02387816	85.34923624	87.6686143	89.75117034	90.99530689	91.80242687
24–24.99 months	1.051272912	86.1973169	0.040859727	79.62133263	80.44776859	81.71946302	83.84213246	86.1973169	88.54917522	90.66315834	91.92706971	92.74741225
25–25.99 months	1.041951175	87.09026318	0.041142161	80.40197647	81.24225735	82.53540957	84.69430336	87.09026318	89.483435	91.63504785	92.92167631	93.75684975
26–26.99 months	1.012592236	87.95714182	0.041349399	81.17554759	82.02666181	83.3369944	85.52592034	87.95714182	90.3875095	92.57420584	93.88254082	94.7320912
27–27.99 months	0.970541909	88.7960184	0.041500428	81.9356973	82.79539596	84.11968453	86.33389245	88.7960184	91.26017565	93.47968776	94.80872819	95.67214661
28–28.99 months	0.921129988	89.6055115	0.041610508	82.67746051	83.54410888	84.87997909	87.11588888	89.6055115	92.10065173	94.35096822	95.69974364	96.57649339
29–29.99 months	0.868221392	90.38476689	0.041691761	83.39711819	84.26956585	85.61531679	87.87028387	90.38476689	92.90858598	95.18792816	96.55551171	97.44504712
30–30.99 months	0.81454413	91.13341722	0.04175368	84.09206184	84.96952943	86.32398013	88.5960919	91.13341722	93.68403041	95.99083262	97.37635253	98.27813528
31–31.99 months	0.761957977	91.8515436	0.041803562	84.76065415	85.64263937	87.00500071	89.29290603	91.8515436	94.42741325	96.76030359	98.16295103	99.07646264
32–32.99 months	0.711660228	92.5396352	0.041846882	85.40209562	86.28829708	87.65806752	89.96083624	92.5396352	95.13950841	97.49728978	98.91632342	99.84107435
33–33.99 months	0.664323379	93.19854429	0.041887626	86.01630353	86.90655881	88.28343922	90.60044644	93.19854429	95.82140026	98.20303421	99.63778417	100.5733217
34–34.99 months	0.620285102	93.82945392	0.041928568	86.60378996	87.49803144	88.88186325	91.21270297	93.82945392	96.47445723	98.87904266	100.328907	101.2748164
35–35.99 months	0.57955631	94.43382278	0.041971514	87.16557262	88.06378819	89.4544988	91.79890839	94.43382278	97.10028751	99.52704954	100.991497	101.9474075

Table 19. *L, M,* and *S,* parameters and selected smoothed percentiles for weight (in kilograms) by sex and recumbent length (in centimeters): Birth to 36 months

Sex and length interval	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
45–45.99 centimeters	1.31794165	2.38617219	0.144790131	1.702957417	1.792954672	1.928805392	2.149314246	2.38617219	2.615766477	2.817044967	2.935328776	3.011338317
46–46.99 centimeters	1.041730589	2.587097922	0.1365472	1.918742401	2.00306056	2.132607345	2.34835311	2.587097922	2.824925474	3.038262787	3.165635227	3.248240003
47–47.99 centimeters	0.756615683	2.797952593	0.129156077	2.139283471	2.219514291	2.344442385	2.556834051	2.797952593	3.044241159	3.270147404	3.407200737	3.49693518
48–48.99 centimeters	0.472617587	3.017679791	0.122589498	2.364025965	2.441421905	2.563170915	2.773593907	3.017679791	3.272646214	3.511467362	3.65864093	3.755928383
49–49.99 centimeters	0.197455933	3.245225583	0.116802688	2.59243106	2.667982282	2.78776291	2.997514515	3.245225583	3.509103506	3.761071952	3.918675144	4.023835077
50–50.99 centimeters	−0.063272822	3.479567767	0.111734963	2.823966844	2.89846365	3.017289051	3.227549277	3.479567767	3.752613117	4.01788174	4.18611338	4.299368538
51–51.99 centimeters	−0.305663778	3.719739648	0.107316407	3.058104103	3.132186651	3.250908274	3.462735881	3.719739648	4.002224198	4.280884515	4.459845507	4.581326217
52–52.99 centimeters	−0.527210764	3.964838222	0.10347453	3.294322225	3.368517223	3.487856107	3.702195087	3.964838222	4.257039544	4.549132322	4.738836361	4.868585555
53–53.99 centimeters	−0.726356263	4.214033476	0.100139369	3.532109837	3.606859589	3.727435106	3.94512977	4.214033476	4.516224426	4.821741654	5.022119957	5.160094928
54–54.99 centimeters	−0.902380499	4.466562625	0.097246097	3.770975175	3.846657516	3.969008144	4.190815779	4.466562625	4.779002851	5.097890522	5.308799266	5.454877316
55–55.99 centimeters	−1.055126826	4.721730669	0.09473644	4.010448329	4.087392272	4.211993219	4.43859789	4.721730669	5.044659815	5.376817878	5.598043337	5.752026649
56–56.99 centimeters	−1.184933443	4.978903744	0.092558749	4.250088071	4.328584525	4.455860069	4.687882702	4.978903744	5.312536448	5.65782066	5.889087035	6.050711037
57–57.99 centimeters	−1.292531809	5.237504753	0.09066765	4.489485537	4.569794994	4.700127546	4.938133749	5.237504753	5.582026947	5.940251499	6.181229894	6.350173518
58–58.99 centimeters	−1.378973111	5.497008915	0.089023438	4.728267233	4.810625098	4.94436155	5.188867126	5.497008915	5.85257519	6.22351642	6.473835067	6.649732739
59–59.99 centimeters	−1.445563111	5.756939907	0.087591418	4.966096999	5.050717205	5.188173227	5.439647821	5.756939907	6.123671792	6.507072866	6.766328167	6.94878282
60–60.99 centimeters	−1.49380121	6.016866693	0.086341291	5.202677038	5.289754427	5.431217262	5.690086611	6.016866693	6.394851791	6.790428163	7.058196003	7.246792315
61–61.99 centimeters	−1.525332827	6.276400575	0.085246598	5.437748497	5.527460202	5.673190232	5.939837222	6.276400575	6.66569255	7.073138226	7.348985362	7.543302768
62–62.99 centimeters	−1.541839648	6.535195541	0.084284401	5.671089001	5.763595946	5.91382859	6.18859526	6.535195541	6.935815081	7.354807872	7.638300762	7.837923511
63–63.99 centimeters	−1.545098045	6.792942366	0.083434649	5.902515543	5.997962236	6.152907479	6.436093976	6.792942366	7.204878803	7.635088323	7.925804423	8.130333399
64–64.99 centimeters	−1.536863318	7.049370425	0.08268004	6.131880558	6.230395557	6.390238592	6.682104069	7.049370425	7.472584314	7.9136782	8.211213607	8.420274027
65–65.99 centimeters	−1.518786093	7.304248994	0.082005843	6.359068402	6.460765369	6.625668165	6.926433317	7.304248994	7.738675499	8.190324128	8.494298133	8.707543698
66–66.99 centimeters	−1.49249029	7.557381995	0.081399411	6.583997561	6.688974915	6.859075839	7.168922842	7.557381995	8.002934684	8.46481824	8.774880112	8.991998822
67–67.99 centimeters	−1.459487925	7.808610136	0.080850107	6.806616368	6.914957848	7.090372671	7.409447317	7.808610136	8.26518536	8.736998815	9.052831095	9.27354736
68–68.99 centimeters	−1.421167427	8.057810266	0.08034908	7.026901165	7.138676485	7.319499566	7.647913807	8.057810266	8.525291839	9.006749431	9.328070124	9.552145587
69–69.99 centimeters	−1.378835366	8.304892397	0.079888977	7.244856495	7.360121388	7.54642602	7.884259416	8.304892397	8.783156413	9.273996989	9.600562566	9.827797569
70–70.99 centimeters	−1.333634661	8.549802669	0.079463915	7.460510099	7.579307642	7.771148283	8.118452209	8.549802669	9.038722435	9.53871203	9.870316803	10.10054839
71–71.99 centimeters	−1.286605147	8.792519752	0.079069193	7.67391364	7.796274848	7.993688292	8.350488663	8.792519752	9.291970609	9.800906186	10.13738322	10.37048464
72–72.99 centimeters	−1.238665517	9.033054944	0.07870118	7.885140184	8.011085035	8.214092237	8.580393153	9.033054944	9.542918966	10.06063106	10.40185184	10.63773097
73–73.99 centimeters	−1.19066716	9.271448675	0.078357096	8.094284811	8.223822595	8.432429492	8.808215482	9.271448675	9.791619211	10.31797568	10.66385133	10.90245061
74–74.99 centimeters	−1.143316882	9.507773605	0.078035021	8.301459453	8.434590571	8.648791006	9.034032141	9.507773605	10.03815952	10.57306631	10.92354547	11.16483888
75–75.99 centimeters	−1.097263403	9.742129356	0.077733651	8.506795026	8.643511567	8.863288423	9.257942887	9.742129356	10.28265908	10.82606321	11.18113275	11.42512564
76–76.99 centimeters	−1.053083813	9.974642178	0.077452242	8.710439238	8.850725924	9.076052776	9.480070094	9.974642178	10.52526749	11.07715916	11.43684424	11.68357247
77–77.99 centimeters	−1.011294273	10.20546331	0.077190512	8.912555531	9.056390619	9.287233301	9.700557381	10.20546331	10.76616287	11.32657755	11.69094178	11.94047127
78–78.99 centimeters	−0.972360231	10.43476723	0.076948562	9.113322086	9.260678201	9.496996252	9.91956818	10.43476723	11.00554988	11.57457043	11.94371638	12.19614287
79–79.99 centimeters	−0.936705887	10.66274993	0.076726804	9.312930869	9.463775754	9.705523721	10.13728428	10.66274993	11.24365775	11.8214166	12.19548652	12.45093578
80–80.99 centimeters	−0.904722736	10.88962699	0.076525901	9.511586717	9.665883884	9.913012453	10.35390433	10.88962699	11.48073815	12.06741962	12.44659654	12.70522492
81–81.99 centimeters	−0.876777097	11.11563177	0.076346711	9.709506461	9.867215725	10.11967266	10.5696423	11.11563177	11.71706321	12.31290587	12.69741505	12.9594104
82–82.99 centimeters	−0.853216568	11.34101346	0.076190236	9.90691806	10.06799596	10.32572684	10.78472594	11.34101346	11.95292329	12.55822265	12.94833337	13.21391629
83–83.99 centimeters	−0.834375406	11.56603512	0.076057579	10.10405976	10.26845983	10.53140858	10.99939524	11.56603512	12.18862496	12.8037362	13.19976391	13.46918953
84–84.99 centimeters	−0.820578855	11.79097176	0.075949901	10.30117927	10.46885221	10.73696139	11.21390081	11.79097176	12.42448873	13.04982974	13.45213869	13.7256987
85–85.99 centimeters	−0.81214646	12.01610828	0.075868383	10.49853295	10.66942663	10.94263752	11.42850232	12.01610828	12.66084697	13.29690152	13.70590772	13.98393299
86–86.99 centimeters	−0.809394398	12.24173753	0.075814185	10.69638497	10.87044435	11.14869679	11.64346692	12.24173753	12.89804158	13.5453628	13.96153752	14.24440109
87–87.99 centimeters	−0.812636889	12.46815824	0.075788413	10.89500657	11.07217344	11.35540546	11.85906768	12.46815824	13.13642183	13.79563586	14.21950956	14.50763019
88–88.99 centimeters	−0.822186712	12.69567298	0.075792075	11.0946752	11.27488782	11.56303507	12.07558197	12.69567298	13.37634196	14.04815191	14.48031873	14.77416503
89–89.99 centimeters	−0.838354876	12.92458613	0.075826044	11.29567376	11.47886643	11.77186133	12.29328999	12.92458613	13.6181589	14.30334895	14.74447181	15.044567
90–90.99 centimeters	−0.861449493	13.15520182	0.075891019	11.49828978	11.68439228	11.98216306	12.51247319	13.15520182	13.86222981	14.56166964	15.01248591	15.31941326
91–91.99 centimeters	−0.891773904	13.38782185	0.075987476	11.70281463	11.89175157	12.19422113	12.73341284	13.38782185	14.10890963	14.82355899	15.28488689	15.59929608
92–92.99 centimeters	−0.929617736	13.6227442	0.076115636	11.90954225	12.10123261	12.4083174	12.95638887	13.6227442	14.35854899	15.08946216	15.5622076	15.88482163
93–93.99 centimeters	−0.975268944	13.86025986	0.076275395	12.1187693	12.31312548	12.62473383	13.18167788	13.86025986	14.61149059	15.35982164	15.84498667	16.17661055

Table 19. *L, M,* and *S,* parameters and selected smoothed percentiles for weight (in kilograms) by sex and recumbent length (in centimeters): Birth to 36 months—Con.

Sex and length interval	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
94–94.99 centimeters	−1.028990493	14.10065234	0.076466299	12.33079298	12.52772045	12.84375146	13.40955269	14.10065234	14.86806787	15.63507513	16.13376622	16.47529604
95–95.99 centimeters	−1.091024455	14.34419522	0.076687482	12.54591071	12.74530738	13.06564953	13.64028082	14.34419522	15.12860179	15.91565257	16.42909034	16.78152407
96–96.99 centimeters	−1.161574946	14.59115139	0.076937631	12.76441819	12.9661743	13.29070461	13.87412402	14.59115139	15.39339911	16.20197359	16.73150285	17.09595206
97–97.99 centimeters	−1.240820737	14.84177007	0.077214912	12.98660961	13.19060724	13.5191898	14.11133652	14.84177007	15.66274835	16.494444	17.04154573	17.41925008
98–98.99 centimeters	−1.328879402	15.0962879	0.077516968	13.21277431	13.41888786	13.75137383	14.3521657	15.0962879	15.93691963	16.79345342	17.35975605	17.75209809
99–99.99 centimeters	−1.425809463	15.35492729	0.077840877	13.44319598	13.65129272	13.98752021	14.59685108	15.35492729	16.21616173	17.09937174	17.68666374	18.09518631
100–100.99 centimeters	−1.531575592	15.61789822	0.078183177	13.67814897	13.88809057	14.22788616	14.8456253	15.61789822	16.50070256	17.41254676	18.02278798	18.44921206
101–101.99 centimeters	−1.646081976	15.88539464	0.078539804	13.91789949	14.12954284	14.47272193	15.09871195	15.88539464	16.79074422	17.73329941	18.36863542	18.81488277
102–102.99 centimeters	−1.769082483	16.15760201	0.078906277	14.16269719	14.37589784	14.722269	15.35632936	16.15760201	17.08646948	18.06192364	18.72469422	19.19290687
Girls												
45–45.99 centimeters	0.699616404	2.403256702	0.157654766	1.723754478	1.805222631	1.932850514	2.151843669	2.403256702	2.662835955	2.90317596	3.049956403	3.146436315
46–46.99 centimeters	0.747915684	2.606020484	0.139389663	1.946460733	2.026496007	2.151303478	2.363960397	2.606020484	2.853889995	3.081735239	3.220172553	3.310892709
47–47.99 centimeters	0.751754737	2.817114082	0.125837223	2.170805299	2.249554961	2.37216013	2.580564792	2.817114082	3.058703241	3.280280685	3.414702479	3.502712567
48–48.99 centimeters	0.691329975	3.035356101	0.115888948	2.396673878	2.474214132	2.595089193	2.80098615	3.035356101	3.275451769	3.496304856	3.630584823	3.718622563
49–49.99 centimeters	0.559107556	3.259693318	0.108648608	2.623845869	2.700266794	2.819827425	3.024685576	3.259693318	3.502419401	3.72742595	3.865029598	3.955569802
50–50.99 centimeters	0.361549127	3.48922017	0.103402703	2.852008338	2.92747924	3.046162798	3.251250865	3.48922017	3.738025406	3.971395567	4.115400222	4.210681986
51–51.99 centimeters	0.116436203	3.723195489	0.099599651	3.08077988	3.155581427	3.273900839	3.480372197	3.723195489	3.980867931	4.2261236	4.37920066	4.481218409
52–52.99 centimeters	−0.152509094	3.961034945	0.096830356	3.309743456	3.384266533	3.502832371	3.71180166	3.961034945	4.229754129	4.489708217	4.654076004	4.76453627
53–53.99 centimeters	−0.421478627	4.202270022	0.09480477	3.538486235	3.613206007	3.732716377	3.945306087	4.202270022	4.483693775	4.760455514	4.937828528	5.058090815
54–54.99 centimeters	−0.671388289	4.446476028	0.093323068	3.766648425	3.842082114	3.963283111	4.180622529	4.446476028	4.741844038	5.036873117	5.228445091	5.359480791
55–55.99 centimeters	−0.889973526	4.693220151	0.092246459	3.99394852	4.070613878	4.194251416	4.417443974	4.693220151	5.003447846	5.317643817	5.524112903	5.666497508
56–56.99 centimeters	−1.071844454	4.942029343	0.091473166	4.22019582	4.298576091	4.425349217	4.65542253	4.942029343	5.267777008	5.601587401	5.823223715	5.977171656
57–57.99 centimeters	−1.216671445	5.192403337	0.090923715	4.445271101	4.525795306	4.656327074	4.894194501	5.192403337	5.534118638	5.887634175	6.124358847	6.289778737
58–58.99 centimeters	−1.327360462	5.443830096	0.090532906	4.669110719	4.75214371	4.886964606	5.133398784	5.443830096	5.801772695	6.174806785	6.426273604	6.602835746
59–59.99 centimeters	−1.408261687	5.69581328	0.090246768	4.891682562	4.977524782	5.117070202	5.372695342	5.69581328	6.070070759	6.462216757	6.72787876	6.91507564
60–60.99 centimeters	−1.464051065	5.947889759	0.090021128	5.112971092	5.201863101	5.34647836	5.611774363	5.947889759	6.33839139	6.749065162	7.028227249	7.225424353
61–61.99 centimeters	−1.499105627	6.199640267	0.089820688	5.332968047	5.42509726	5.57504651	5.850360248	6.199640267	6.606171625	7.034644746	7.326504329	7.532980555
62–62.99 centimeters	−1.517197913	6.450695818	0.089618171	5.551666409	5.64717487	5.80265208	6.088213081	6.450695818	6.872915135	7.318342	7.622019771	7.836997958
63–63.99 centimeters	−1.521479703	6.700736725	0.089393174	5.769060531	5.868051772	6.029190763	6.325126546	6.700736725	7.138192567	7.59963607	7.914202723	8.136875366
64–64.99 centimeters	−1.514481331	6.949493534	0.089131254	5.985144406	6.08769022	6.254574837	6.560927184	6.949493534	7.401643498	7.878098236	8.202595917	8.432144771
65–65.99 centimeters	−1.498204976	7.196744733	0.088822943	6.199912645	6.306059022	6.478732239	6.795472337	7.196744733	7.662974516	8.15338936	8.486850867	8.722463522
66–66.99 centimeters	−1.474231858	7.442313819	0.088462854	6.413361985	6.523134146	6.701605945	7.028648027	7.442313819	7.921956215	8.425256531	8.766723181	9.00760766
67–67.99 centimeters	−1.443808911	7.686067039	0.088048963	6.625492182	6.738899009	6.923153436	7.260367355	7.686067039	8.17842062	8.693529674	9.04206755	9.287464886
68–68.99 centimeters	−1.407959107	7.92790936	0.087581916	6.836308446	6.953345818	7.143346471	7.49056809	7.92790936	8.432256562	8.958117069	9.312833279	9.562029761
69–69.99 centimeters	−1.367521025	8.167783677	0.087064605	7.045821054	7.166475096	7.362170518	7.719212002	8.167783677	8.683408324	9.219002186	9.579058661	9.831395513
70–70.99 centimeters	−1.32324327	8.405666621	0.086501667	7.254047943	7.378297165	7.579624634	7.946282454	8.405666621	8.931870645	9.47623884	9.840866488	10.09574977
71–71.99 centimeters	−1.275834578	8.641566305	0.085899159	7.461015613	7.588832522	7.795721098	8.171783008	8.641566305	9.177685743	9.729947188	10.09845888	10.35536822
72–72.99 centimeters	−1.226014257	8.875519723	0.085264271	7.666760352	7.798112411	8.010485082	8.395735838	8.875519723	9.420939935	9.980309503	10.3521122	10.61060874
73–73.99 centimeters	−1.174555804	9.107590221	0.084605096	7.871329398	8.006179356	8.223954294	8.61818018	9.107590221	9.661760324	10.22756595	10.60217203	10.86190554
74–74.99 centimeters	−1.122323639	9.337865054	0.083930435	8.07478203	8.213087629	8.436178609	8.839170822	9.337865054	9.900311537	10.47201035	10.84904795	11.10976332
75–75.99 centimeters	−1.070302348	9.566453061	0.083249631	8.277190538	8.418903651	8.647219687	9.05877667	9.566453061	10.13679255	10.7139859	11.09320847	11.35475136
76–76.99 centimeters	−1.019617172	9.793482492	0.082572421	8.478641037	8.623706299	8.857150596	9.277079452	9.793482492	10.37143354	10.95388092	11.33517576	11.59749766
77–77.99 centimeters	−0.971544123	10.01909902	0.081908788	8.679234065	8.82758712	9.066055489	9.494172583	10.01909902	10.60449286	11.19212443	11.57552036	11.83868308
78–78.99 centimeters	−0.927495981	10.24346467	0.081268832	8.879084281	9.03065003	9.274029292	9.710160711	10.24346467	10.83625465	11.42918192	11.81485555	12.07903468
79–79.99 centimeters	−0.889046221	10.46675386	0.080662561	9.078322619	9.233012616	9.481177715	9.925157686	10.46675386	11.06702353	11.66554993	12.05383282	12.3193224
80–80.99 centimeters	−0.857844783	10.6891553	0.080099785	9.277093118	9.434804244	9.68761705	10.13928821	10.6891553	11.29712459	11.90175234	12.29313502	12.56034996
81–81.99 centimeters	−0.835600041	10.91086924	0.079589888	9.475553729	9.636166759	9.893474476	10.35268693	10.91086924	11.52689868	12.13833477	12.53347134	12.80295084
82–82.99 centimeters	−0.824007806	11.13210717	0.079141623	9.673874713	9.837253816	10.0988884	10.56549933	11.13210717	11.75669976	12.37585953	12.77557129	13.04798203

Table 19. *L, M,* and *S,* parameters and selected smoothed percentiles for weight (in kilograms) by sex and recumbent length (in centimeters): Birth to 36 months—Con.

Sex and length interval	Percentile											
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
83–83.99 centimeters	–0.824673085	11.35309164	0.078762888	9.872236954	10.03823028	10.30400903	10.77788274	11.35309164	11.98689198	12.61490029	13.02017859	13.29631805
84–84.99 centimeters	–0.839021353	11.57405623	0.078460511	10.07082987	10.2392715	10.50899902	10.9900078	11.57405623	12.21784683	12.85603662	13.26804494	13.54884494
85–85.99 centimeters	–0.868191531	11.79524697	0.078240047	10.26984825	10.44056188	10.71403421	11.20206069	11.79524697	12.44994139	13.0998487	13.51992325	13.80645301
86–86.99 centimeters	–0.912987527	12.0169203	0.078105554	10.46949211	10.64229536	10.9193044	11.41424337	12.0169203	12.68355339	13.346911	13.77656207	14.07003317
87–87.99 centimeters	–0.973732843	12.23934838	0.078059544	10.66996042	10.84467191	11.12501362	11.62677789	12.23934838	12.91906338	13.59778826	14.03869722	14.3404656
88–88.99 centimeters	–1.050238631	12.46281861	0.078102898	10.87145032	11.04789724	11.33138025	11.83990685	12.46281861	13.15685175	13.85303006	14.3070456	14.61861423
89–89.99 centimeters	–1.141750538	12.68763627	0.078234935	11.07415394	11.25218061	11.53863663	12.05389519	12.68763627	13.39729953	14.1131669	14.5822978	14.90531723
90–90.99 centimeters	–1.246935039	12.9141268	0.078453576	11.27825609	11.45773296	11.74702786	12.26903094	12.9141268	13.64078954	14.37870706	14.86511095	15.20137719
91–91.99 centimeters	–1.363881842	13.1426393	0.078755652	11.48393116	11.66476403	11.95681	12.48562589	13.1426393	13.88771008	14.65013514	15.1561012	15.50754879
92–92.99 centimeters	–1.490235591	13.37354263	0.079137144	11.69134669	11.87348344	12.16824818	12.70401141	13.37354263	14.13845236	14.92790917	15.45583919	15.82453284
93–93.99 centimeters	–1.623204367	13.60723197	0.079593737	11.9006578	12.08409573	12.38161332	12.92453941	13.60723197	14.39341959	15.21246325	15.76484189	16.1529576
94–94.99 centimeters	–1.759750536	13.84412275	0.080121122	12.11201227	12.29680209	12.5971797	13.14757603	13.84412275	14.65302443	15.5042068	16.08356951	16.49337198
95–95.99 centimeters	–1.896722704	14.08464853	0.080715361	12.32555163	12.51179974	12.81522219	13.37349756	14.08464853	14.91769089	15.80352641	16.41242128	16.84623319
96–96.99 centimeters	–2.031079769	14.32925018	0.081372938	12.54141939	12.72928607	13.03601505	13.60268237	14.32925018	15.1878468	16.11078394	16.75173457	17.21190355
97–97.99 centimeters	–2.159985258	14.57837334	0.082090922	12.75976132	12.9494582	13.25983009	13.83550775	14.57837334	15.4639243	16.42631821	17.10178143	17.59063809
98–98.99 centimeters	–2.280992946	14.8324557	0.082866693	12.98073439	13.17251854	13.48693728	14.07234276	14.8324557	15.74634796	16.7504403	17.46276845	17.9825849
99–99.99 centimeters	–2.392125361	15.09192012	0.083697706	13.20451042	13.39867734	13.71760521	14.31354493	15.09192012	16.03552754	17.08342993	17.83483458	18.38778042
100–100.99 centimeters	–2.491985117	15.35716167	0.08458092	13.43128538	13.62815947	13.95210374	14.55945515	15.35716167	16.33184172	17.42552542	18.21805007	18.80615497
101–101.99 centimeters	–2.579688446	15.62854849	0.085512655	13.66127661	13.86120318	14.19070443	14.81039951	15.62854849	16.63563645	17.77692011	18.61241094	19.23752318
102–102.99 centimeters	–2.654922113	15.90640903	0.086487929	13.89473275	14.09806774	14.43368432	15.06668553	15.90640903	16.94720609	18.13774777	19.01783635	19.68159413

Table 20. *L, M,* and *S,* parameters and selected smoothed percentiles for head circumference (in centimeters) by sex and age: Birth to 36 months

Sex and age				Percentile								
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
Birth	4.427825037	35.81366835	0.052172542	31.48762321	32.14881105	33.08389492	34.46951803	35.81366835	37.00426196	37.97379421	38.51574	38.85417217
0–0.99 months	4.310927464	37.19361054	0.047259148	33.25005839	33.83391575	34.67252717	35.93986771	37.19361054	38.3212548	39.24988502	39.77261565	40.10028445
1–1.99 months	3.869576802	39.20742929	0.040947903	35.78126227	36.26427603	36.97376845	38.07877607	39.20742929	40.2498675	41.12605049	41.62581415	41.94137873
2–2.99 months	3.305593039	40.65233195	0.037027722	37.55879748	37.97958783	38.60724429	39.60636994	40.65233195	41.63967944	42.48435504	42.97189144	43.28180775
3–3.99 months	2.720590297	41.76516959	0.034364245	38.89944028	39.27893049	39.85122805	40.77712846	41.76516959	42.71454952	43.5390162	44.01984454	44.3273323
4–4.99 months	2.16804824	42.66116148	0.032462175	39.956733	40.30765556	40.8411358	41.71483367	42.66116148	43.58358267	44.39471535	44.87197284	45.17876946
5–5.99 months	1.675465689	43.40488731	0.031064702	40.8164238	41.14714268	41.65290563	42.48888872	43.40488731	44.30801	45.11034335	45.58592624	45.89299742
6–6.99 months	1.255160322	44.03609923	0.03002267	41.53109397	41.84741554	42.33330145	43.14204136	44.03609923	44.92554888	45.72225458	46.19735808	46.50523827
7–7.99 months	0.91054114	44.58096912	0.029242173	42.13520784	42.44134027	42.91311128	43.70245428	44.58096912	45.46103549	46.25442887	46.7298272	47.03879825
8–8.99 months	0.639510474	45.05761215	0.028660454	42.65252672	42.95162383	43.41364704	44.18963565	45.05761215	45.93165855	46.72349076	47.19970004	47.50989695
9–9.99 months	0.436978864	45.4790756	0.0282336	43.1000854	43.39457866	43.85025055	44.61764431	45.4790756	46.34979269	47.14142337	47.61879558	47.93026746
10–10.99 months	0.296275856	45.85505706	0.027929764	43.49049033	43.78229887	44.23431798	44.99693519	45.85505706	46.72463077	47.5171388	47.99592075	48.30866909
11–11.99 months	0.210107251	46.19295427	0.027725179	43.83331672	44.12398596	44.57453557	45.33548679	46.19295427	47.06318161	47.85743833	48.33780885	48.65181107
12–12.99 months	0.171147024	46.49853438	0.027601686	44.1359978	44.42679395	44.87766812	45.6395204	46.49853438	47.37090639	48.1676259	48.64971976	48.96494367
13–13.99 months	0.172393886	46.77637684	0.027545148	44.40441201	44.69638826	45.14908116	45.91397652	46.77637684	47.65213989	48.4519147	48.93583823	49.25225076
14–14.99 months	0.207371541	47.03017599	0.027544382	44.6432831	44.93732702	45.39309769	46.16284044	47.03017599	47.9103782	48.71370522	49.19954641	49.51711865
15–15.99 months	0.270226126	47.2629533	0.027590417	44.85646007	45.1533284	45.61324855	46.38937093	47.2629533	48.14848042	48.95578033	49.44361553	49.76232529
16–16.99 months	0.355757274	47.47720989	0.02767598	45.0471177	45.34746216	45.81245227	46.5962646	47.47720989	48.36881356	49.18044547	49.67034368	49.99017661
17–17.99 months	0.459407627	47.67503833	0.027795115	45.21790307	45.52229008	45.99314685	46.78577645	47.67503833	48.57335854	49.38963138	49.88165697	50.20260675
18–18.99 months	0.577227615	47.85820606	0.0279429	45.37104465	45.67997038	46.1573882	46.95980996	47.85820606	48.76378933	49.58497069	50.07918514	50.40125302
19–19.99 months	0.705826778	48.02821867	0.028115241	45.50843477	45.82233697	46.30692463	47.1199854	48.02821867	48.94153284	49.767856	50.26431891	50.58751304
20–20.99 months	0.842319055	48.18636864	0.028308707	45.63169289	45.95096016	46.4432543	47.2676925	48.18636864	49.10781495	49.93948448	50.43825419	50.76258871
21–21.99 months	0.984266833	48.3337732	0.028520407	45.74221477	46.06719402	46.56766983	47.4041314	48.3337732	49.26369641	50.10089268	50.60202648	50.92752068
22–22.99 months	1.129626698	48.47140432	0.028747896	45.84121112	46.17221358	46.68129357	47.53034509	48.47140432	49.41010098	50.25298383	50.75653813	51.0832155
23–23.99 months	1.276691223	48.60011223	0.028989089	45.92973857	46.26704456	46.78510558	47.64724492	48.60011223	49.54783776	50.39654965	50.90258011	51.23046767
24–24.99 months	1.424084853	48.72064621	0.029242207	46.00872286	46.35258644	46.87996641	47.75563267	48.72064621	49.67762038	50.53228805	51.04084871	51.36997568
25–25.99 months	1.570621291	48.83366629	0.029505723	46.07898233	46.42963351	46.96663488	47.85621436	48.83366629	49.80007885	50.6608169	51.17196156	51.50235977
26–26.99 months	1.715393998	48.93976089	0.029778323	46.14123974	46.49888834	47.0457837	47.9496179	48.93976089	49.91577508	50.78268619	51.29646691	51.62816923
27–27.99 months	1.857652984	49.03945383	0.030058871	46.19613885	46.56097639	47.11801133	48.03640172	49.03945383	50.02521023	50.89838727	51.41485491	51.74789519
28–28.99 months	1.996810563	49.13321432	0.030346384	46.24425435	46.61645615	47.18385241	48.11706526	49.13321432	50.12883385	51.00836092	51.52756491	51.8619775
29–29.99 months	2.132411346	49.22146409	0.030640006	46.28610129	46.66582817	47.24378625	48.19205668	49.22146409	50.22705052	51.11300399	51.63499226	51.97081164
30–30.99 months	2.264111009	49.30458348	0.030938992	46.32214286	46.70954267	47.29824404	48.26177952	49.30458348	50.32022568	51.212675	51.73749389	52.0747544
31–31.99 months	2.391658052	49.38291658	0.031242693	46.35279696	46.7480058	47.34761489	48.32659828	49.38291658	50.4086904	51.30769888	51.83539311	52.17412868
32–32.99 months	2.514878222	49.45677569	0.031550537	46.37844176	46.78158515	47.39225099	48.38684322	49.45677569	50.49274559	51.39837096	51.92898358	52.26922758
33–33.99 months	2.633661226	49.526445	0.031862026	46.39942043	46.81061427	47.43247203	48.44281439	49.526445	50.57266545	51.48496048	52.01853284	52.36031789
34–34.99 months	2.747949445	49.59218385	0.03217672	46.41604524	46.83539667	47.46856894	48.49478513	49.59218385	50.64870057	51.56771347	52.10428523	52.44764311
35–35.99 months	2.857728375	49.65422952	0.032494231	46.42860105	46.85620919	47.50080715	48.54300509	49.65422952	50.72108047	51.64685536	52.18646448	52.53142603
Girls												
Birth	−1.298749689	34.7115617	0.046905108	31.93019666	32.25089861	32.75948527	33.65186554	34.7115617	35.85124044	36.9534983	37.65137722	38.12110271
0–0.99 months	−1.440271514	36.03453876	0.042999604	33.38070525	33.68743507	34.17345861	35.02508397	36.03453876	37.11806755	38.16405088	38.82535049	39.27005698
1–1.99 months	−1.581016348	37.97671987	0.038067862	35.48627093	35.77560367	36.23325692	37.03281566	37.97671987	38.9853304	39.95458524	40.56517149	40.97482424
2–2.99 months	−1.593136386	39.3801263	0.035079612	36.98550023	37.26521982	37.70685493	38.47603153	39.3801263	40.34145495	41.2606303	41.83732218	42.22321458
3–3.99 months	−1.521492427	40.46773733	0.033096443	38.13114313	38.40560987	38.83813686	39.58904997	40.46773733	41.39732095	42.28152907	42.83395649	43.20260356
4–4.99 months	−1.394565915	41.34841008	0.03170963	39.04619196	39.31813786	39.74588078	40.4861083	41.34841008	42.2560375	43.11489105	43.64924082	44.00485959
5–5.99 months	−1.231713389	42.0833507	0.030709039	39.79959574	40.07085921	40.49672423	41.23135738	42.0833507	42.97566066	43.81574641	44.33630066	44.68183088
6–6.99 months	−1.046582628	42.71033603	0.029974303	40.43379494	40.70567458	41.13171253	41.86434514	42.71033603	43.59207071	44.41814599	44.92802856	45.26562921
7–7.99 months	−0.848932692	43.25428882	0.029430992	40.97671526	41.25016088	41.67787092	42.41113299	43.25428882	44.1289691	44.94460711	45.44618705	45.77750554

Table 20. *L, M,* and *S,* parameters and selected smoothed percentiles for head circumference (in centimeters) by sex and age: Birth to 36 months—Con.

Sex and age	Percentile											
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
8–8.99 months	−0.645779124	43.73249646	0.029030379	41.44767738	41.72340175	42.15390873	42.88977797	43.73249646	44.60281599	45.41078317	45.90591158	46.23224218
9–9.99 months	−0.442165412	44.15742837	0.028739112	41.86058302	42.1391311	42.57329563	43.31329057	44.15742837	45.025498	45.82798881	46.31814685	46.64053024
10–10.99 months	−0.24163206	44.53836794	0.028533537	42.22575305	42.50754798	42.94603917	43.69134604	44.53836794	45.40587424	46.2046631	46.69105794	47.01034581
11–11.99 months	−0.046673786	44.88240562	0.028396382	42.55105219	42.83642568	43.27976931	44.03132658	44.88240562	45.75071845	46.54726413	47.0308956	47.34779597
12–12.99 months	0.141031094	45.19507651	0.028314722	42.84260355	43.13181766	43.58043062	44.33898883	45.19507651	46.06532374	46.86084173	47.34254856	47.65765724
13–13.99 months	0.320403169	45.48078147	0.028278682	43.10526272	43.39852553	43.85274045	44.61890505	45.48078147	46.3539026	47.14941728	47.62991078	47.9437344
14–14.99 months	0.490807133	45.74307527	0.028280585	43.34294145	43.64041855	44.10050201	44.87476468	45.74307527	46.61986076	47.41624393	47.89613288	48.20910612
15–15.99 months	0.65193505	45.98486901	0.028314363	43.55883459	43.86065785	44.32682391	45.10958609	45.98486901	46.86598965	47.66398946	48.14379909	48.45629769
16–16.99 months	0.803718086	46.20857558	0.028375159	43.75558315	44.06185727	44.53427792	45.32586864	46.20857558	47.09460485	47.89486804	48.37505457	48.68740549
17–17.99 months	0.946259679	46.41621635	0.028459033	43.93539362	44.24620133	44.72501451	45.52570414	46.41621635	47.30764771	48.11073684	48.59169895	48.90418837
18–18.99 months	1.079784984	46.60950084	0.028562759	44.10012707	44.4155332	44.90084908	45.71086007	46.60950084	47.50676129	48.31316842	48.79525631	49.10813597
19–19.99 months	1.204602687	46.78988722	0.028683666	44.25136665	44.57142131	45.06332728	45.88284266	46.78988722	47.69334806	48.50350565	48.98702837	49.30052069
20–20.99 months	1.321076285	46.95862881	0.028819525	44.39046947	44.71521065	45.21377531	46.04294544	46.95862881	47.86861428	48.68290399	49.16813538	49.48243771
21–21.99 months	1.429602576	47.11681039	0.028968459	44.51860703	44.84806267	45.35333901	46.19228703	47.11681039	48.03360465	48.85236462	49.33954821	49.65483625
22–22.99 months	1.530595677	47.26537682	0.029128879	44.63679702	44.9709867	45.48301476	46.33184096	47.26537682	48.18922971	49.01276045	49.50211352	49.81854421
23–23.99 months	1.624475262	47.40515585	0.029299426	44.74592866	45.08486501	45.60367396	46.46245944	47.40515585	48.3362876	49.16485698	49.65657394	49.97428788
24–24.99 months	1.71165803	47.53687649	0.029478937	44.8467831	45.19047292	45.71608285	46.58489242	47.53687649	48.47548169	49.30932908	49.80358436	50.12270782
25–25.99 months	1.792551616	47.66118396	0.029666406	44.94004992	45.28849516	45.82091847	46.69980317	47.66118396	48.60743482	49.44677462	49.94372506	50.26437172
26–26.99 months	1.867550375	47.77865186	0.02986096	45.02634065	45.37953915	45.91878183	46.80778091	47.77865186	48.73270105	49.57772565	50.07751255	50.39978499
27–27.99 months	1.93703258	47.8897923	0.030061839	45.10619989	45.46414607	46.01020865	46.90935129	47.8897923	48.85177527	49.70265762	50.20540857	50.52939951
28–28.99 months	2.001358669	47.99506422	0.030268375	45.18011452	45.54279995	46.09567835	47.00498513	47.99506422	48.96510128	49.82199704	50.32782741	50.65362082
29–29.99 months	2.060870301	48.09488048	0.030479985	45.24852146	45.61593528	46.17562155	47.0951056	48.09488048	49.07307846	49.93612795	50.44514221	50.77281425
30–30.99 months	2.115889982	48.18961365	0.03069615	45.31181411	45.68394345	46.25042633	47.18009439	48.18961365	49.17606748	50.04539729	50.55769018	50.88731003
31–31.99 months	2.16672113	48.2796011	0.030916413	45.37034782	45.74717813	46.32044357	47.26029687	48.2796011	49.27439505	50.15011948	50.66577699	50.99740757
32–32.99 months	2.21364844	48.36514917	0.031140368	45.42444455	45.80595987	46.38599146	47.33602646	48.36514917	49.36835799	50.25058031	50.7696806	51.10337919
33–33.99 months	2.256943216	48.44653703	0.031367651	45.47439662	45.86057993	46.44735943	47.40756856	48.44653703	49.45822692	50.34704031	50.86965434	51.20547307
34–34.99 months	2.296844024	48.52401894	0.031597939	45.52047097	45.91130407	46.50481123	47.47518307	48.52401894	49.54424855	50.43973755	50.96593013	51.30391674
35–35.99 months	2.333589434	48.59782828	0.031830942	45.56291074	45.95837475	46.55858812	47.53910827	48.59782828	49.62664932	50.52889019	51.05872021	51.39891816

Table 21. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and stature (in centimeters): 77 to 121 cm

Sex and stature interval	Percentile													
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th	97th
Boys														
77–77.99 centimeters	–0.979897716	10.38901871	0.076995353	9.073267731	9.219922075	9.455148545	9.875875665	10.38901871	10.95778248	11.289158	11.289158	11.52507288	11.8932524	12.14509038
78–78.99 centimeters	–0.943555181	10.61724901	0.076769511	9.27309208	9.423242003	9.663907823	10.09383533	10.61724901	11.19612673	11.53275921	11.53275921	11.77212488	12.14519668	12.40002986
79–79.99 centimeters	–0.91080778	10.84432907	0.076564374	9.47192154	9.625531353	9.871587899	10.31065794	10.84432907	11.43339148	11.77536897	11.77536897	12.01827111	12.39640999	12.65438854
80–80.99 centimeters	–0.882026316	11.07048885	0.076380766	9.669970612	9.827000834	10.07839639	10.52655452	11.07048885	11.66984493	12.01728516	12.01728516	12.26383357	12.6472562	12.90856157
81–81.99 centimeters	–0.857561667	11.29597453	0.076219662	9.867465098	10.02787289	10.28455342	10.7417502	11.29597453	11.90577397	12.25882589	12.25882589	12.50915553	12.89812222	13.16296835
82–82.99 centimeters	–0.837750377	11.52104655	0.07608215	10.06464125	10.22838074	10.49029047	10.95648264	11.52104655	12.14148209	12.50032738	12.50032738	12.75459958	13.14941636	13.41805131
83–83.99 centimeters	–0.822919198	11.74597768	0.075969382	10.26174496	10.4287674	10.69584915	11.17100044	11.74597768	12.37728721	12.7421419	12.7421419	13.00054571	13.40156684	13.6742748
84–84.99 centimeters	–0.813388595	11.97105103	0.075882537	10.45903091	10.62928475	10.90148006	11.38556161	11.97105103	12.61351947	12.98463561	12.98463561	13.24738933	13.6550202	13.93212398
85–85.99 centimeters	–0.809475279	12.19655799	0.075822785	10.65676178	10.83019257	11.10744159	11.60043192	12.19655799	12.85051907	13.22818647	13.22818647	13.49553926	13.91023979	14.19210372
86–86.99 centimeters	–0.811493792	12.4227963	0.075791244	10.85520745	11.03175764	11.31399881	11.81588337	12.4227963	13.08863398	13.47318203	13.47318203	13.74541572	14.1677042	14.45473759
87–87.99 centimeters	–0.8197572	12.65006791	0.075788944	11.0546442	11.2342528	11.52142229	12.03219261	12.65006791	13.32821763	13.72001718	13.72001718	13.99744832	14.42790576	14.72056689
88–88.99 centimeters	–0.834576932	12.87867701	0.07581679	11.25535391	11.43795604	11.729987	12.24963938	12.87867701	13.56962661	13.96909189	13.96909189	14.25207386	14.691349	14.99014975
89–89.99 centimeters	–0.856261805	13.10892794	0.075875517	11.45762324	11.64314963	11.93997121	12.46850502	13.10892794	13.81321822	14.22080884	14.22080884	14.50973427	14.95854908	15.26406025
90–90.99 centimeters	–0.885116299	13.34112314	0.075965652	11.66174286	11.85011921	12.15165548	12.68907093	13.34112314	14.05934806	14.47557099	14.47557099	14.77087425	15.23003025	15.54288768
91–91.99 centimeters	–0.921432943	13.5755615	0.076087468	11.86800626	12.05915274	12.36532155	12.91161745	13.5755615	14.30836781	14.73377926	14.73377926	15.03593913	15.50632408	15.82723547
92–92.99 centimeters	–0.965501267	13.81253552	0.076240931	12.07670968	12.27054003	12.58125142	13.13642188	13.81253552	14.56062192	14.99582939	14.99582939	15.30537214	15.78796821	16.11772149
93–93.99 centimeters	–1.017588552	14.05233041	0.076425662	12.28815023	12.48457136	12.7997264	13.36375794	14.05233041	14.81644595	15.2621099	15.2621099	15.57961215	16.07550416	16.41497639
94–94.99 centimeters	–1.077941994	14.29522185	0.07664088	12.50262539	12.70153676	13.02102616	13.59389429	14.29522185	15.07616355	15.53299897	15.53299897	15.85909086	16.36947582	16.71964365
95–95.99 centimeters	–1.146773671	14.54147499	0.076885365	12.72043131	12.92172471	13.24542786	13.82709389	14.54147499	15.3400845	15.80886196	15.80886196	16.14423022	16.6704272	17.03237842
96–96.99 centimeters	–1.224269596	14.79134177	0.07715739	12.94186266	13.14542179	13.47320539	14.06361249	14.79134177	15.60850108	16.09004772	16.09004772	16.435439	16.97890086	17.35384839
97–97.99 centimeters	–1.310558831	15.04506152	0.077454707	13.16720979	13.37291056	13.70462839	14.30369892	15.04506152	15.88168735	16.37688676	16.37688676	16.73311035	17.29543503	17.6847315
98–98.99 centimeters	–1.405713355	15.30285949	0.077774507	13.39675772	13.60446875	13.9399615	14.54759427	15.30285949	16.15989645	16.6696879	16.6696879	17.03761835	17.62056129	18.02571601
99–99.99 centimeters	–1.509717075	15.56494815	0.078113436	13.6307828	13.84036679	14.17946326	14.79553258	15.56494815	16.4433606	16.96873685	16.96873685	17.34931547	17.95480122	18.3774979
100–100.99 centimeters	–1.622491233	15.83152429	0.078467542	13.86955335	14.08086791	14.42338546	15.04773906	15.83152429	16.73228676	17.27429143	17.27429143	17.66852815	18.29866436	18.74078304
101–101.99 centimeters	–1.743825743	16.10277448	0.078832409	14.11332298	14.3262235	14.6719715	15.30443284	16.10277448	17.02686105	17.58658316	17.58658316	17.99555569	18.65264302	19.11628039
102–102.99 centimeters	–1.873365511	16.37887678	0.079203258	14.3623275	14.57667057	14.92545486	15.56582724	16.37887678	17.32724961	17.90581651	17.90581651	18.33066799	19.01720839	19.5046992
103–103.99 centimeters	–2.010641647	16.65999867	0.079574978	14.61678517	14.83243136	15.18405792	15.83212792	16.65999867	17.63359604	18.23216547	18.23216547	18.67410169	19.39280771	19.90675015
104–104.99 centimeters	–2.154957918	16.94630912	0.079942558	14.8768847	15.09370466	15.44798851	16.10353776	16.94630912	17.94603443	18.56578254	18.56578254	19.02606388	19.77985667	20.32312999
105–105.99 centimeters	–2.305458316	17.23797444	0.08030117	15.14278742	15.36066627	15.71743814	16.38025293	17.23797444	18.26468632	18.90679586	18.90679586	19.38672911	20.1787374	20.75452347
106–106.99 centimeters	–2.461019713	17.53517134	0.080646757	15.41461403	15.63345894	15.99257708	16.66246685	17.53517134	18.58967772	19.25532299	19.25532299	19.75624737	20.58979116	21.20158343
107–107.99 centimeters	–2.62033059	17.83808212	0.080976208	15.69244676	15.91219242	16.27355169	16.95036489	17.83808212	18.92113785	19.61147125	19.61147125	20.13474455	21.01331726	21.66492986
108–108.99 centimeters	–2.781787762	18.14690821	0.0812881	15.97631447	16.19693164	16.56047764	17.24412681	18.14690821	19.25922069	19.97535804	19.97535804	20.52233698	21.44956767	22.14512329
109–109.99 centimeters	–2.943638944	18.46185811	0.081582687	16.26619982	16.48769998	16.85343765	17.54391749	18.46185811	19.60409781	20.34710882	20.34710882	20.91913269	21.89875002	22.64266738
110–110.99 centimeters	–3.103888502	18.78315936	0.081862656	16.56202375	16.78446659	17.15247356	17.84988762	18.78315936	19.95598136	20.72688185	20.72688185	21.32525216	22.36102622	23.15797665
111–111.99 centimeters	–3.260482798	19.11103983	0.082132791	16.86365693	17.08715301	17.4575854	18.16216193	19.11103983	20.31510927	21.11486155	21.11486155	21.74082861	22.83652027	23.69138309
112–112.99 centimeters	–3.411305599	19.44572803	0.082400213	17.17091316	17.39562697	17.76872619	18.48083577	19.44572803	20.68175356	21.51127205	21.51127205	22.16602327	23.32532325	24.24311525
113–113.99 centimeters	–3.554288672	19.78744004	0.082674023	17.48355487	17.70970539	18.08580073	18.80596716	19.78744004	21.05620975	21.91637379	21.91637379	22.60102871	23.82750255	24.81329664
114–114.99 centimeters	–3.687600863	20.13635563	0.082964333	17.80130995	18.02916633	18.40866976	19.13756712	20.13635563	21.43876754	22.3304406	22.3304406	23.04605609	24.34311131	25.40196582
115–115.99 centimeters	–3.809599339	20.49262111	0.083282267	18.12386353	18.35374284	18.73714656	19.47560008	20.49262111	21.8297156	22.75376667	22.75376667	23.50134403	24.87219375	26.00905839
116–116.99 centimeters	–3.919005213	20.85632542	0.083638758	18.45087764	18.68313795	19.0710044	19.81997697	20.85632542	22.22930525	23.18663214	23.18663214	23.96713325	25.41479043	26.63443908
117–117.99 centimeters	–4.014882272	21.2274989	0.084044246	18.78199002	19.01702441	19.40997727	20.17055644	21.2274989	22.63774393	23.62929478	23.62929478	24.44365939	25.97093854	27.27790257
118–118.99 centimeters	–4.096683061	21.60610366	0.084508001	19.11682286	19.35505216	19.75376486	20.52714418	21.60610366	23.05517462	24.08196605	24.08196605	24.93113135	26.54066898	27.93919453
119–119.99 centimeters	–4.164160421	21.9920407	0.085038256	19.45497491	19.69684281	20.1020308	20.88949663	21.9920407	23.48168087	24.54481209	24.54481209	25.42972912	27.12400191	28.61800412
120–120.99 centimeters	–4.217425718	22.3851382	0.085641503	19.79603451	20.0420005	20.45440956	21.25732015	22.3851382	23.91726195	25.01792347	25.01792347	25.93957405	27.72093757	29.31399641

Table 21. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and stature (in centimeters): 77 to 121 cm—Con.

Sex and stature interval	Percentile													
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th	P97
Girls														
77–77.99 centimeters	–0.935908436	10.19868351	0.081394448	8.839167516	8.990097375	9.232504092	9.667046213	10.19868351	10.78999185	11.13546634	11.13546634	11.38184191	11.76703846	12.03099456
78–78.99 centimeters	–0.89621042	10.42217324	0.080780644	9.038517201	9.192590101	9.439808634	9.882231734	10.42217324	11.02093382	11.36987072	11.36987072	11.61830668	12.00603364	12.27123186
79–79.99 centimeters	–0.863423474	10.64473659	0.080208403	9.23736905	9.39448496	9.646379965	10.09652511	10.64473659	11.25114165	11.60377608	11.60377608	11.85449919	12.24521487	12.51204563
80–80.99 centimeters	–0.839250279	10.86657146	0.079687207	9.43587839	9.595921376	9.852343066	10.31005891	10.86657146	11.4809532	11.837632	11.837632	12.09096109	12.48528658	12.75426396
81–81.99 centimeters	–0.825395013	11.08788714	0.079225952	9.634213141	9.797050683	10.05783406	10.52297639	11.08788714	11.71072003	12.07190393	12.07190393	12.32825177	12.72697467	12.99873959
82–82.99 centimeters	–0.823487667	11.30890397	0.078832728	9.832552217	9.998035565	10.26300074	10.73543239	11.30890397	11.94080449	12.30706872	12.30706872	12.56694308	12.97102053	13.24634405
83–83.99 centimeters	–0.834997067	11.52985331	0.078514592	10.03108351	10.19904933	10.46800322	10.94759478	11.52985331	12.17157684	12.54361009	12.54361009	12.80761383	13.21817476	13.49796154
84–84.99 centimeters	–0.861125495	11.75097872	0.078277372	10.23000087	10.40027462	10.67301464	11.15964652	11.75097872	12.40341329	12.78201467	12.78201467	13.05084457	13.46919053	13.75448195
85–85.99 centimeters	–0.90275588	11.97253416	0.078125431	10.42950375	10.60190372	10.87822198	11.37178607	11.97253416	12.63669132	13.02276601	13.02276601	13.29721122	13.72481792	14.01679695
86–86.99 centimeters	–0.960308955	12.19478883	0.078061602	10.62979128	10.80413535	11.08382637	11.5842315	12.19478883	12.87179128	13.26634311	13.26634311	13.54728098	13.98579574	14.28578915
87–87.99 centimeters	–1.033704489	12.41802682	0.078087089	10.83106129	11.00717426	11.29004337	11.79722112	12.41802682	13.10909353	13.51321579	13.51321579	13.80160677	14.25284528	14.56232653
88–88.99 centimeters	–1.122303405	12.64254963	0.078201515	11.03350713	11.21122918	11.49710258	12.01101528	12.64254963	13.34897889	13.76384274	13.76384274	14.06072319	14.52666298	14.84725316
89–89.99 centimeters	–1.224887418	12.86867851	0.07840306	11.23731521	11.41651085	11.70524667	12.22589739	12.86867851	13.59182967	14.01867037	14.01867037	14.32514317	14.80791321	15.14137958
90–90.99 centimeters	–1.339655646	13.09675786	0.078688751	11.44266196	11.62322932	11.91472966	12.44217465	13.09675786	13.83803305	14.27813372	14.27813372	14.59535621	15.0972208	15.44547079
91–91.99 centimeters	–1.464342037	13.32715202	0.079054697	11.64971679	11.83159463	12.12581512	12.66017439	13.32715202	14.08797892	14.54265433	14.54265433	14.87182549	15.39516617	15.76023982
92–92.99 centimeters	–1.596224732	13.56025156	0.079496621	11.85863674	12.04181213	12.33877299	12.88024501	13.56025156	14.34206849	14.81264629	14.81264629	15.15499004	15.70227723	16.0863298
93–93.99 centimeters	–1.732305592	13.79646793	0.080010179	12.06957102	12.25408376	12.55387711	13.10275007	13.79646793	14.6007123	15.08851573	15.08851573	15.44526407	16.01902591	16.42430655
94–94.99 centimeters	–1.869440665	14.03623165	0.080591346	12.28266198	12.46860734	12.77140239	13.32806438	14.03623165	14.86433237	15.37066369	15.37066369	15.74303877	16.34582383	16.77464616
95–95.99 centimeters	–2.004558693	14.27998232	0.081236502	12.49805271	12.68558031	12.99162337	13.55656614	14.27998232	15.13335566	15.65948286	15.65948286	16.04868075	16.68302101	17.13773099
96–96.99 centimeters	–2.134764169	14.5281658	0.08194262	12.71588767	12.9051993	13.21481233	13.78863356	14.5281658	15.40821452	15.95535951	15.95535951	16.36253385	17.0309025	17.51383737
97–97.99 centimeters	–2.257524917	14.78122196	0.082707038	12.93632124	13.12766544	13.44123956	14.02463766	14.78122196	15.68933564	16.25866615	16.25866615	16.68491497	17.38968816	17.90313512
98–98.99 centimeters	–2.370762249	15.03957746	0.083527227	13.15952176	13.35318702	13.67117381	14.2649386	15.03957746	15.97713269	16.56975626	16.56975626	17.01611063	17.75953058	18.30568297
99–99.99 centimeters	–2.472965302	15.30363303	0.084400264	13.38568043	13.58198599	13.9048846	14.50988056	15.30363303	16.2719909	16.88895128	16.88895128	17.35636782	18.14051413	18.72143304
100–100.99 centimeters	–2.563140425	15.5737634	0.085322654	13.61500935	13.81429721	14.14264285	14.759793	15.5737634	16.57426445	17.21653714	17.21653714	17.70589007	18.5326498	19.15022213
101–101.99 centimeters	–2.640873937	15.8503043	0.086289668	13.84775164	14.05037619	14.38472456	15.01498669	15.8503043	16.88425753	17.55274622	17.55274622	18.06482316	18.93587281	19.59178174
102–102.99 centimeters	–2.706178899	16.1335593	0.087295416	14.08417388	14.29049454	14.63141037	15.27575841	16.1335593	17.20222861	17.89775821	17.89775821	18.4332529	19.35003441	20.04572382
103–103.99 centimeters	–2.759500412	16.42379037	0.088332358	14.32457385	14.53494603	14.88298893	15.54238872	16.42379037	17.52837462	18.2516835	18.2516835	18.8111906	19.77489735	20.51154925
104–104.99 centimeters	–2.801578893	16.72122308	0.089391426	14.56927503	14.78404331	15.13975644	15.8151455	16.72122308	17.86283343	18.61456222	18.61456222	19.1985691	20.21012731	20.98863696
105–105.99 centimeters	–2.833376069	17.02604617	0.090461996	14.81862634	15.03811803	15.40201748	16.09428485	17.02604617	18.20567994	18.98635782	18.98635782	19.5952351	20.65528582	21.47624048
106–106.99 centimeters	–2.855987198	17.33841369	0.09153201	15.07299942	15.29751915	15.67008464	16.38005272	17.33841369	18.55692603	19.3669544	19.3669544	20.00094429	21.10982248	21.97348019
107–107.99 centimeters	–2.870584724	17.65844486	0.092588053	15.33278813	15.56261274	15.94427872	16.67268526	17.65844486	18.91651802	19.75615211	19.75615211	20.41535516	21.57306793	22.47933846
108–108.99 centimeters	–2.878341197	17.98622785	0.093615622	15.59840399	15.83377861	16.2249273	16.97241047	17.98622785	19.28434006	20.15366815	20.15366815	20.83802746	22.04422649	22.99264818
109–109.99 centimeters	–2.880404823	18.32181829	0.094599184	15.87027673	16.11141079	16.5123649	17.27944769	18.32181829	19.66021061	20.55913174	20.55913174	21.2684158	22.5223689	23.51208703
110–110.99 centimeters	–2.877853767	18.66524194	0.095522442	16.14885045	16.39591448	16.80693136	17.5940083	18.66524194	20.04388538	20.97208562	20.97208562	21.7058694	23.00642737	24.03616881
111–111.99 centimeters	–2.871676584	19.01649457	0.096368448	16.43458256	16.6877053	17.10897135	17.91629559	19.01649457	20.43505617	21.39198329	21.39198329	22.14962753	23.49518765	24.56323314
112–112.99 centimeters	–2.86277466	19.37553957	0.097119646	16.72794483	16.98720984	17.41883434	18.24650364	19.37553957	20.8333469	21.81818429	21.81818429	22.59881442	23.98728419	25.09144275
113–113.99 centimeters	–2.851915004	19.74231348	0.097758211	17.02941648	17.29486046	17.73687191	18.58481884	19.74231348	21.23832075	22.24995962	22.24995962	23.05244169	24.48119347	25.61876629
114–114.99 centimeters	–2.839760032	20.11672014	0.098265916	17.33948852	17.61109835	18.06343891	18.93141779	20.11672014	21.64947133	22.6864823	22.6864823	23.50939939	24.97522873	26.14297963
115–115.99 centimeters	–2.826824189	20.4986363	0.098624434	17.65865664	17.93636825	18.39889081	19.28646882	20.4986363	22.06622967	23.12683271	23.12683271	23.96845835	25.46753358	26.66164921
116–116.99 centimeters	–2.813480089	20.88790914	0.09881529	17.98742223	18.27111906	18.74358385	19.65013122	20.88790914	22.48795967	23.56999284	23.56999284	24.42826397	25.95607618	27.17212889
117–117.99 centimeters	–2.799924586	21.28435965	0.09882	18.32628747	18.61580027	19.09787338	20.02255635	21.28435965	22.91396132	24.01484769	24.01484769	24.8873352	26.43864271	27.67154822
118–118.99 centimeters	–2.786142221	21.6877854	0.098620143	18.67575115	18.97085907	19.46211272	20.40388907	21.6877854	23.34347238	24.46018471	24.46018471	25.34406179	26.91283039	28.15680318
119–119.99 centimeters	–2.771843402	22.09796571	0.098197431	19.03630228	19.33673586	19.83665164	20.79427025	22.09796571	23.77567219	24.90469458	24.90469458	25.79670194	27.37603973	28.62454542
120–120.99 centimeters	–2.756365595	22.51466977	0.097533789	19.4084109	19.71385824	20.22183471	21.19384134	22.51466977	24.20968794	25.34697329	25.34697329	26.24338024	27.82546527	29.07117005

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
24–24.99 months	−0.216501213	12.74154396	0.108166006	10.4414422	10.70051298	11.11490406	11.85181666	12.74154396	13.71386029	14.6671577	15.27629562	15.68840631
25–25.99 months	−0.239790488	12.88102276	0.108274706	10.55847309	10.81957536	11.23747341	11.98141892	12.88102276	13.86589625	14.83331632	15.45242405	15.87169941
26–26.99 months	−0.266315853	13.01842382	0.108421025	10.67380261	10.93681171	11.35805876	12.10888759	13.01842382	14.0162298	14.99847794	15.62818936	16.05514188
27–27.99 months	−0.295754969	13.1544966	0.10860477	10.78798157	11.05280067	11.47727994	12.23490671	13.1544966	14.1656725	15.16351231	15.80450043	16.23967114
28–28.99 months	−0.327729368	13.28989667	0.108825681	10.90147346	11.168034	11.59566994	12.36007175	13.28989667	14.31493214	15.32917196	15.98213866	16.42608957
29–29.99 months	−0.361817468	13.42519408	0.109083424	11.01466395	11.28292555	11.7136834	12.48489772	13.42519408	14.46462206	15.49610261	16.16176896	16.61507584
30–30.99 months	−0.397568087	13.56088113	0.109377581	11.12786972	11.3978197	11.83170451	12.60982671	13.56088113	14.61526973	15.66485286	16.34395025	16.80719583
31–31.99 months	−0.434520252	13.69737858	0.109707646	11.24134752	11.51299966	11.95005435	12.73523417	13.69737858	14.76732387	15.83588309	16.52914562	17.00291386
32–32.99 months	−0.472188756	13.83504622	0.110073084	11.3552982	11.62869248	12.06899744	12.86143776	13.83504622	14.9211657	16.00957526	16.71773017	17.2025984
33–33.99 months	−0.510116627	13.97418299	0.110473254	11.46987889	11.74507892	12.18874828	12.98869962	13.97418299	15.07711012	16.18623907	16.91000204	17.40653734
34–34.99 months	−0.547885579	14.1150324	0.1109074	11.58520959	11.86229971	12.30947723	13.11723187	14.1150324	15.23541179	16.36611917	17.10619066	17.61494698
35–35.99 months	−0.58507011	14.25779618	0.111374787	11.70137143	11.98045644	12.43131521	13.24720657	14.25779618	15.3962791	16.54940494	17.30646132	17.8279717
36–36.99 months	−0.621319726	14.40262749	0.111874514	11.81842214	12.09962308	12.55435953	13.37875374	14.40262749	15.5598683	16.73623287	17.51092666	18.04570363
37–37.99 months	−0.656295986	14.54964614	0.112405687	11.93639129	12.21984466	12.67867752	13.51197197	14.54964614	15.72629889	16.92669619	17.7196494	18.26817893
38–38.99 months	−0.689735029	14.69893326	0.112967254	12.05529277	12.34114672	12.80431149	13.64692711	14.69893326	15.89564892	17.12084685	17.93265202	18.49539445
39–39.99 months	−0.721410388	14.85054151	0.11355811	12.17512305	12.46353554	12.93128204	13.78365965	14.85054151	16.06796532	17.31870281	18.14992024	18.72730763
40–40.99 months	−0.751175223	15.00449143	0.114176956	12.29587074	12.5870056	13.05959214	13.92218431	15.00449143	16.24326063	17.52024974	18.37141087	18.96385009
41–41.99 months	−0.778904279	15.16078454	0.114822482	12.41751102	12.71153714	13.18922941	14.06249859	15.16078454	16.4215262	17.72544898	18.59705318	19.20492292
42–42.99 months	−0.804515498	15.31940246	0.115493292	12.54001161	12.83710098	13.32016918	14.2045836	15.31940246	16.60273167	17.93423997	18.8267549	19.45040584
43–43.99 months	−0.828003255	15.48030313	0.116187777	12.66334091	12.96366474	13.45237788	14.34840318	15.48030313	16.78682117	18.14654091	19.06040859	19.70016918
44–44.99 months	−0.849380372	15.64343309	0.116904306	12.78746137	13.09118938	13.5858142	14.49391163	15.64343309	16.97372594	18.36225594	19.29789203	19.95406774
45–45.99 months	−0.86869965	15.80872535	0.117641148	12.91233523	13.21963362	13.72043155	14.64105343	15.80872535	17.16336229	18.58127627	19.53907323	20.21194963
46–46.99 months	−0.886033992	15.97610456	0.118396541	13.03792328	13.34895376	13.85617947	14.78976688	15.97610456	17.3556371	18.80348418	19.78381251	20.47365655
47–47.99 months	−0.901507878	16.14548194	0.119168555	13.16419231	13.47910915	13.99300607	14.93998212	16.14548194	17.55044259	19.02875229	20.03196776	20.73903469
48–48.99 months	−0.915241589	16.31676727	0.11995532	13.29110715	13.61005739	14.13085804	15.0916281	16.31676727	17.74766896	19.25695041	20.28339348	21.00792648
49–49.99 months	−0.927377772	16.4898646	0.120754916	13.41863676	13.74175874	14.26968247	15.24463077	16.4898646	17.94720007	19.48794495	20.53794512	21.28017953
50–50.99 months	−0.938069819	16.66467529	0.121565421	13.54675344	13.87417598	14.40942768	15.39891519	16.66467529	18.14891672	19.72160147	20.79548054	21.55564717
51–51.99 months	−0.94747794	16.84109948	0.122384927	13.67543322	14.0072749	14.55004391	15.55440665	16.84109948	18.35269841	19.95778649	21.05586181	21.83419011
52–52.99 months	−0.955765694	17.01903746	0.123211562	13.8046561	14.14102471	14.69148397	15.71103166	17.01903746	18.55842485	20.19636905	21.31895671	22.11567799
53–53.99 months	−0.963096972	17.1983908	0.124043503	13.93440617	14.27539832	14.83370375	15.86871877	17.1983908	18.76597736	20.43722215	21.58464011	22.39999059
54–54.99 months	−0.969633434	17.37906341	0.124878992	14.06467165	14.41037252	14.97666256	16.0273993	17.37906341	18.9752401	20.68022399	21.85279508	22.68701888
55–55.99 months	−0.975532355	17.56096245	0.125716348	14.19544485	14.54592801	15.12032345	16.18700795	17.56096245	19.18610119	20.92525904	22.12331387	22.97666583
56–56.99 months	−0.980937915	17.74400082	0.126554022	14.3267205	14.68204842	15.26465308	16.34748412	17.74400082	19.39845556	21.17221993	22.3960982	23.26884512
57–57.99 months	−0.986006518	17.92809121	0.127390453	14.45850147	14.81872422	15.40962296	16.50876909	17.92809121	19.61219848	21.42100482	22.67106204	23.56348925
58–58.99 months	−0.99086694	18.11315625	0.128224294	14.59079005	14.95594682	15.55520788	16.670811	18.11315625	19.82723683	21.67152294	22.94812899	23.86053886
59–59.99 months	−0.995644402	18.29912286	0.129054277	14.7235931	15.09371211	15.70138696	16.83356209	18.29912286	20.04348292	21.92369204	23.22723469	24.15995003
60–60.99 months	−1.000453886	18.48592413	0.129879257	14.85692044	15.23201937	15.8481433	16.99697963	18.48592413	20.26085668	22.17743954	23.50832656	24.46169255
61–61.99 months	−1.005399668	18.67349965	0.130698212	14.99078448	15.37087094	15.9954639	17.16102601	18.67349965	20.47928605	22.43270288	23.79136391	24.76574995
62–62.99 months	−1.010575003	18.86179576	0.131510245	15.12519986	15.51027205	16.14333947	17.32566884	18.86179576	20.69870731	22.6894297	24.07631802	25.07211926
63–63.99 months	−1.016061941	19.05076579	0.132314586	15.26018306	15.65023042	16.29176433	17.49088098	19.05076579	20.9190654	22.94757799	24.36317198	25.38081076
64–64.99 months	−1.021931241	19.24037019	0.133110593	15.39575201	15.79075599	16.44073615	17.65664052	19.24037019	21.14031403	23.20711615	24.65192058	25.69184758
65–65.99 months	−1.028242376	19.43057662	0.133897752	15.53192567	15.93186059	16.59025577	17.82293074	19.43057662	21.36241588	23.46802293	24.94257	26.00526525
66–66.99 months	−1.035043608	19.62136007	0.134675673	15.66872366	16.07355758	16.74032694	17.98974005	19.62136007	21.58534268	23.73028735	25.23513755	26.32111112
67–67.99 months	−1.042372125	19.8127028	0.13544409	15.80616582	16.21586154	16.8909561	18.15706188	19.8127028	21.80907518	23.99390857	25.52965118	26.63944376
68–68.99 months	−1.050254232	20.0045944	0.13620286	15.94427185	16.35878793	17.04215212	18.32489457	20.0045944	22.03360322	24.25889565	25.82614911	26.96033222
69–69.99 months	−1.058705595	20.19703171	0.136951959	16.08306098	16.50235277	17.19392605	18.49324122	20.19703171	22.25892561	24.52526733	26.12467926	27.28385531
70–70.99 months	−1.067731529	20.39001872	0.137691478	16.22255158	16.64657235	17.34629087	18.66210955	20.39001872	22.48505007	24.79305175	26.42529873	27.6101008
71–71.99 months	−1.077321193	20.58356862	0.138421673	16.36275897	16.79146158	17.49926081	18.83151262	20.58356862	22.71199557	25.06228739	26.72807261	27.93916194
72–72.99 months	−1.087471249	20.77769565	0.139142773	16.50370229	16.93703875	17.65285271	19.00146515	20.77769565	22.93978291	25.33301794	27.03307565	28.27114631

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
73–73.99 months	−1.098152984	20.97242631	0.139855242	16.64539409	17.08331814	17.80708353	19.17198834	20.97242631	23.16844769	25.60529875	27.34038832	28.60616106
74–74.99 months	−1.10933408	21.16779192	0.140559605	16.78784656	17.23031439	17.96197153	19.34310643	21.16779192	23.39803173	25.87919213	27.6500983	28.94432077
75–75.99 months	−1.120974043	21.36383013	0.141256489	16.93106986	17.37804118	18.11753578	19.51484724	21.36383013	23.62858485	26.15476795	27.96229925	29.2857444
76–76.99 months	−1.133024799	21.56058467	0.141946613	17.07507197	17.52651109	18.2737959	19.68724198	21.56058467	23.86016456	26.43210324	28.27709021	29.63055429
77–77.99 months	−1.145431351	21.75810506	0.142630785	17.21985864	17.6757355	18.43077195	19.86032494	21.75810506	24.09283575	26.71128177	28.59457486	29.97887524
78–78.99 months	−1.158132499	21.95644627	0.143309898	17.36543339	17.82572453	18.58848423	20.03413327	21.95644627	24.32667035	26.99239357	28.91486092	30.33083356
79–79.99 months	−1.171061612	22.15566842	0.143984924	17.51179749	17.97648696	18.74695318	20.20870673	22.15566842	24.56174697	27.27553447	29.23805946	30.68655618
80–80.99 months	−1.184141975	22.35583862	0.144656953	17.65894807	18.12802886	18.90619877	20.38408835	22.35583862	24.79815314	27.56080718	29.56428369	31.04616685
81–81.99 months	−1.197307185	22.55702268	0.145327009	17.80688538	18.28035866	19.06624222	20.56032091	22.55702268	25.03597537	27.84831538	29.89365038	31.40979543
82–82.99 months	−1.210475099	22.75929558	0.145996289	17.95560314	18.4334803	19.22710346	20.73745116	22.75929558	25.27531174	28.13817063	30.2262764	31.77756321
83–83.99 months	−1.223565263	22.9627344	0.146666	18.10509471	18.58739757	19.38880264	20.9155269	22.9627344	25.51626345	28.43048732	30.56227989	32.14959054
84–84.99 months	−1.236497304	23.16741888	0.147337375	18.25535252	18.74211363	19.55135989	21.09459707	23.16741888	25.75893543	28.72538282	30.90177938	32.52599493
85–85.99 months	−1.249186293	23.37343341	0.148011715	18.4063661	18.89762965	19.71479476	21.2747126	23.37343341	26.00343881	29.02297867	31.24489263	32.90688716
86–86.99 months	−1.261555446	23.58086145	0.148690256	18.55812709	19.05394835	19.87912757	21.45592408	23.58086145	26.24988395	29.32339625	31.59173734	33.29237745
87–87.99 months	−1.273523619	23.78979096	0.149374297	18.71062426	19.21107044	20.044378	21.63828396	23.78979096	26.49838713	29.62676053	31.94242919	33.68256717
88–88.99 months	−1.285013783	24.00031064	0.150065107	18.86384686	19.36899699	20.21056603	21.82184504	24.00031064	26.74906587	29.93319702	32.29708214	34.07755271
89–89.99 months	−1.295952066	24.21251028	0.150763933	19.01778428	19.52772926	20.37771189	22.00666068	24.21251028	27.00203925	30.24283177	32.65580771	34.47742403
90–90.99 months	−1.306268473	24.42648043	0.151471982	19.17242647	19.68726895	20.54583618	22.19278461	24.42648043	27.25742737	30.55579074	33.01871449	34.88226421
91–91.99 months	−1.31589753	24.642312	0.152190413	19.32776424	19.84761848	20.71496001	22.38027095	24.642312	27.51535075	30.87219924	33.38590769	35.2921491
92–92.99 months	−1.324778843	24.86009596	0.152920322	19.48378967	20.00878127	20.88510518	22.56917407	24.86009596	27.77592982	31.19218135	33.75748861	35.707147
93–93.99 months	−1.332857581	25.07992303	0.153662731	19.64049642	20.17076208	21.05629437	22.75954858	25.07992303	28.03928438	31.51585929	34.13355425	36.12731836
94–94.99 months	−1.340080195	25.30188584	0.154418635	19.79787788	20.33356558	21.22855059	22.95145019	25.30188584	28.30553622	31.8433549	34.51419632	36.55271218
95–95.99 months	−1.346412105	25.52606977	0.155188768	19.95593574	20.49720276	21.40189997	23.14493249	25.52606977	28.57479705	32.17478161	34.89950266	36.98337837
96–96.99 months	−1.351813296	25.75256528	0.155973912	20.1146687	20.66168259	21.57636833	23.34005152	25.75256528	28.84718437	32.51025437	35.28955426	37.41934991
97–97.99 months	−1.356253969	25.9814599	0.156774684	20.27408001	20.82701772	21.75198362	23.53686295	25.9814599	29.12281085	32.84988252	35.68442647	37.86065382
98–98.99 months	−1.359710858	26.2128399	0.157591579	20.43417606	20.9932234	21.92877558	23.73542282	26.2128399	29.40178631	33.19377093	36.08418823	38.30730842
99–99.99 months	−1.362167159	26.44679027	0.158424964	20.59496663	21.16031766	22.10677591	23.93578761	26.44679027	29.68421748	33.54201944	36.48890176	38.75932329
100–100.99 months	−1.363612378	26.68339457	0.159275071	20.75646502	21.32832161	22.28601843	24.13801431	26.68339457	29.97020767	33.8947225	36.89862215	39.21669915
101–101.99 months	−1.364042106	26.92273494	0.160141995	20.91868832	21.49725951	22.46653924	24.34216053	26.92273494	30.25985653	34.25196875	37.31339712	39.67942783
102–102.99 months	−1.363457829	27.16489199	0.161025689	21.08165758	21.66715902	22.64837687	24.54828458	27.16489199	30.5532598	34.61384061	37.73326669	40.14749235
103–103.99 months	−1.361865669	27.40994539	0.161925976	21.24539741	21.83805093	22.83157226	24.7564457	27.40994539	30.85050986	34.98041447	38.15826287	40.62086606
104–104.99 months	−1.35928261	27.65796978	0.162842452	21.40993987	22.00997207	23.01617007	24.96670281	27.65796978	31.15169009	35.35175676	38.5884101	41.09951874
105–105.99 months	−1.355720571	27.90904433	0.163774719	21.57531575	22.18295884	23.20221593	25.17911785	27.90904433	31.45688766	35.72793225	39.02372343	41.58340237
106–106.99 months	−1.351202536	28.16324264	0.164722138	21.74156399	22.35705429	23.38975956	25.39375238	28.16324264	31.76617973	36.10899472	39.46421007	42.07246636
107–107.99 months	−1.345754408	28.42063744	0.165683945	21.90872739	22.53230492	23.57885344	25.61066925	28.42063744	32.07963965	36.49499102	39.90986854	42.56665066
108–108.99 months	−1.339405453	28.68130005	0.166659247	22.07685313	22.70876108	23.769553	25.82993243	28.68130005	32.39733625	36.8859604	40.36068858	43.06588662
109–109.99 months	−1.332188093	28.94530029	0.167647017	22.24599293	22.8864771	23.96191672	26.05160708	28.94530029	32.71933351	37.28193426	40.81665117	43.57009739
110–110.99 months	−1.324137479	29.21270645	0.168646104	22.41620302	23.06551129	24.15600612	26.27575951	29.21270645	33.04569055	37.68293608	41.27772848	44.07919809
111–111.99 months	−1.315291073	29.48358527	0.169655235	22.58754414	23.24592593	24.35188577	26.50245719	29.48358527	33.37646157	38.08898133	41.74388392	44.59309597
112–112.99 months	−1.30568824	29.75800198	0.170673022	22.76008145	23.42778723	24.54962324	26.73176876	29.75800198	33.7116958	38.50007744	42.21507216	45.11169064
113–113.99 months	−1.295369867	30.03602021	0.17169797	22.93388449	23.61116524	24.74928911	26.96376399	30.03602021	34.05143747	38.9162238	42.69123922	45.63487433
114–114.99 months	−1.284374967	30.31770417	0.17272854	23.10902476	23.79613202	24.95095592	27.19851432	30.31770417	34.39572894	39.33741401	43.17232241	46.16252884
115–115.99 months	−1.272750864	30.60311107	0.173762961	23.28558367	23.98276774	25.15470129	27.43609072	30.60311107	34.74459982	39.76362815	43.65825106	46.69453697
116–116.99 months	−1.260539193	30.89230072	0.174799493	23.46364195	24.17115246	25.36060368	27.67656629	30.89230072	35.09808092	40.19484291	44.14894598	47.23076853
117–117.99 months	−1.247783611	31.18532984	0.175836284	23.6432856	24.36137073	25.56874466	27.92001453	31.18532984	35.45619608	40.63102576	44.64432008	47.77108893
118–118.99 months	−1.234527763	31.48225315	0.176871417	23.8246044	24.55351042	25.77920825	28.16650963	31.48225315	35.81896391	41.07213642	45.1442785	48.31535768
119–119.99 months	−1.220815047	31.78312329	0.177902912	24.00769173	24.74766249	25.99208072	28.41612623	31.78312329	36.18639776	41.51812687	45.64871885	48.86342877
120–120.99 months	−1.206688407	32.08799062	0.17892874	24.19264433	24.94392079	26.20745042	28.66893932	32.08799062	36.55850564	41.96894158	46.15753154	49.41515104
121–121.99 months	−1.19219015	32.39690313	0.17994683	24.37956211	25.14238189	26.42540754	28.92502395	32.39690313	36.9352902	42.42451755	46.67060006	49.97036852

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
122–122.99 months	−1.177361786	32.7099062	0.180955078	24.5685479	25.34314479	26.64604388	29.18445509	32.7099062	37.31674867	42.88478457	47.18780128	50.52892088
123–123.99 months	−1.162243894	33.02704244	0.181951361	24.75970717	25.54631065	26.86945259	29.44730733	33.02704244	37.70287276	43.34966531	47.70900582	51.09064381
124–124.99 months	−1.146876007	33.34835148	0.182933537	24.95314776	25.75198256	27.09572788	29.7136546	33.34835148	38.09364865	43.81907554	48.23407839	51.65536941
125–125.99 months	−1.131296524	33.67386973	0.183899465	25.14897956	25.96026515	27.32496472	29.98356997	33.67386973	38.48905687	44.29292431	48.76287816	52.22292668
126–126.99 months	−1.115542634	34.00363017	0.184847006	25.3473142	26.17126436	27.55725852	30.25712523	34.00363017	38.88907228	44.77111415	49.29525914	52.79314187
127–127.99 months	−1.099650267	34.33766207	0.185774041	25.54826471	26.38508699	27.79270478	30.53439065	34.33766207	39.29366396	45.2535413	49.83107058	53.36583897
128–128.99 months	−1.083654055	34.67599076	0.18667847	25.75194512	26.60184044	28.03139872	30.8154346	34.67599076	39.70279517	45.74009589	50.37015732	53.94084012
129–129.99 months	−1.067587314	35.01863732	0.187558229	25.95847011	26.82163224	28.27343489	31.1003232	35.01863732	40.11642323	46.23066219	50.91236024	54.51796605
130–130.99 months	−1.051482972	35.36561737	0.18841128	26.16795559	27.0445704	28.51890714	31.38911963	35.36561737	40.53449819	46.72511793	51.45751679	55.09703793
131–131.99 months	−1.035367321	35.71694723	0.189235738	26.38051177	27.27075818	28.76790586	31.6818858	35.71694723	40.95697152	47.22334049	52.00546039	55.67786843
132–132.99 months	−1.019277299	36.07262569	0.190029545	26.59626062	27.50030694	29.02052392	31.97867622	36.07262569	41.38377162	47.72519072	52.55602363	56.26028801
133–133.99 months	−1.003235326	36.43265996	0.190790973	26.81530934	27.73331628	29.27684696	32.27954601	36.43265996	41.81483955	48.23053714	53.10903452	56.84410756
134–134.99 months	−0.987269866	36.79704392	0.191518224	27.03777112	27.96988937	29.53696045	32.58454356	36.79704392	42.25009969	48.73923662	53.66432034	57.42914961
135–135.99 months	−0.971406609	37.1657671	0.192209619	27.26375553	28.21012567	29.80094595	32.89371309	37.1657671	42.68947235	49.25114312	54.22170647	58.01523548
136–136.99 months	−0.955670107	37.53881268	0.192863569	27.49336962	28.45412164	30.06888124	33.20709368	37.53881268	43.13287143	49.76610635	54.7810171	58.60218796
137–137.99 months	−0.940083834	37.91615721	0.193478582	27.72671746	28.70197022	30.34083979	33.52471882	37.91615721	43.58020437	50.28397203	55.34207557	59.18983178
138–138.99 months	−0.924670244	38.2977703	0.194053274	27.96389959	28.95376036	30.61689027	33.84661596	38.2977703	44.03137211	50.80458216	55.90470472	59.77799389
139–139.99 months	−0.909450843	38.6836143	0.194586368	28.20501252	29.20957645	30.89709604	34.17280606	38.6836143	44.48626901	51.32777521	56.46872726	60.36650388
140–140.99 months	−0.894446258	39.07364401	0.195076705	28.4501482	29.46949781	31.18151463	34.50330312	39.07364401	44.94478284	51.85338637	57.03396609	60.95519425
141–141.99 months	−0.879676305	39.46780643	0.195523246	28.69939347	29.73359819	31.47019723	34.83811379	39.46780643	45.40679475	52.38124777	57.6002446	61.54390076
142–142.99 months	−0.865160071	39.86604044	0.195925079	28.95282957	30.00194519	31.76318818	35.17723687	39.86604044	45.8721792	52.91118868	58.167387	62.13246268
143–143.99 months	−0.850915987	40.26827652	0.196281418	29.21053153	30.27459974	32.06052445	35.52066292	40.26827652	46.34080401	53.44303574	58.73521857	62.72072311
144–144.99 months	−0.836961905	40.67443658	0.196591612	29.47256769	30.55161562	32.36223514	35.8683738	40.67443658	46.81253029	53.97661318	59.30356596	63.30852916
145–145.99 months	−0.823315176	41.08443363	0.19685514	29.73899917	30.83303885	32.66834099	36.22034231	41.08443363	47.28721249	54.51174297	59.87225739	63.89573222
146–146.99 months	−0.809992726	41.49817164	0.19707162	30.00987927	31.11890724	32.97885387	36.57653175	41.49817164	47.76469837	55.04824506	60.44112289	64.48218816
147–147.99 months	−0.797011132	41.91554528	0.197240806	30.28525305	31.40924987	33.29377635	36.9368956	41.91554528	48.24482905	55.58593751	61.00999451	65.06775743
148–148.99 months	−0.784386693	42.33643978	0.197362591	30.56515671	31.70408654	33.61310119	37.3013771	42.33643978	48.72743903	56.1246367	61.5787065	65.65230527
149–149.99 months	−0.772135506	42.76073078	0.197437004	30.84961718	32.00342738	33.93681092	37.669909	42.76073078	49.21235624	56.66415748	62.14709543	66.23570179
150–150.99 months	−0.760273528	43.18828419	0.19746421	31.13865154	32.30727227	34.26487746	38.04241318	43.18828419	49.6994021	57.20431332	62.71500036	66.81782206
151–151.99 months	−0.748815968	43.61895703	0.197444522	31.43226571	32.61560983	34.59726137	38.4188008	43.61895703	50.1883928	57.74491716	63.28226272	67.39854494
152–152.99 months	−0.737780398	44.0525931	0.197378345	31.73045808	32.92841993	34.9339128	38.79897039	44.0525931	50.67913392	58.2857783	63.84872734	67.97775861
153–153.99 months	−0.727181568	44.48903027	0.197266263	32.03321196	33.24566815	35.27476898	39.18281045	44.48903027	51.17142989	58.82670813	64.41424088	68.5553511
154–154.99 months	−0.717035494	44.92809483	0.197108968	32.34050069	33.56730937	35.61975555	39.57019714	44.92809483	51.66507694	59.36751587	64.97865313	69.13121752
155–155.99 months	−0.707358338	45.36960315	0.196907274	32.6522856	33.8932863	35.96878581	39.96099475	45.36960315	52.15986523	59.90801	65.54181664	69.70525793
156–156.99 months	−0.698166437	45.81336172	0.196662115	32.96851571	34.22352911	36.32176053	40.35505561	45.81336172	52.65557906	60.44799828	66.1035867	70.27737718
157–157.99 months	−0.689476327	46.25916729	0.196374538	33.28912731	34.5579552	36.67856768	40.75222006	46.25916729	53.15199704	60.98728788	66.66382131	70.8474848
158–158.99 months	−0.68130475	46.70680701	0.196045701	33.61404373	34.8964689	37.03908232	41.15231646	46.70680701	53.64889226	61.52568545	67.22238111	71.41549477
159–159.99 months	−0.673668658	47.15605863	0.195676862	33.94317499	35.23896126	37.40316649	41.55516124	47.15605863	54.14603254	62.06299719	67.77912926	71.98132532
160–160.99 months	−0.666585194	47.60669074	0.19526938	34.27641756	35.58530989	37.7706691	41.96055897	47.60669074	54.64318067	62.59902894	68.33393136	72.54489869
161–161.99 months	−0.660069969	48.05846572	0.19482473	34.61365176	35.9353771	38.14142532	42.36830371	48.05846572	55.14009784	63.13358794	68.88665453	73.10613746
162–162.99 months	−0.654142602	48.51113138	0.19434441	34.95474943	36.28901539	38.51525867	42.77817554	48.51113138	55.63653354	63.66647721	69.43716965	73.66497514
163–163.99 months	−0.648819666	48.96443224	0.193830046	35.29956396	36.64606043	38.89197851	43.1899454	48.96443224	56.13223889	64.19750276	69.98534819	74.22134215
164–164.99 months	−0.644118611	49.41810374	0.193283319	35.64793577	37.00633501	39.27138168	43.6033728	49.41810374	56.62695959	64.72646954	70.53106367	74.77517319
165–165.99 months	−0.640056805	49.87187409	0.192705974	35.99969112	37.36964826	39.65325233	44.01820683	49.87187409	57.12043787	65.25318239	71.07419108	75.32640513
166–166.99 months	−0.636651424	50.32546478	0.192099812	36.354642	37.73579576	40.03736224	44.43418656	50.32546478	57.61241293	65.77744608	71.6146066	75.87497649
167–167.99 months	−0.633919328	50.77859121	0.191466681	36.71258626	38.10455963	40.42347105	44.8510416	50.77859121	58.10262135	66.29906539	72.15218736	76.42082697
168–168.99 months	−0.631876912	51.23096332	0.190808471	37.07330766	38.47570882	40.81132672	45.26849262	51.23096332	58.59079757	66.81784516	72.68681109	76.96389688
169–169.99 months	−0.63053994	51.68228625	0.190127105	37.43657601	38.84899932	41.20066588	45.68625203	51.68228625	59.07667438	67.33359031	73.21835588	77.50412655
170–170.99 months	−0.629923353	52.13226113	0.18942453	37.80214741	39.22417451	41.5912144	46.10402466	52.13226113	59.55998349	67.846106	73.7466998	78.04145573

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
171–171.99 months	–0.630041066	52.58058583	0.188702714	38.16976444	39.60096552	41.98268787	46.5215085	52.58058583	60.04045606	68.35519765	74.27172061	78.57582294
172–172.99 months	–0.630905733	53.02695588	0.187963636	38.53915657	39.97909172	42.37479226	46.93839552	53.02695588	60.51782332	68.86067105	74.79329538	79.10716478
173–173.99 months	–0.632528509	53.47106525	0.187209281	38.91004046	40.35826115	42.76722456	47.35437254	53.47106525	60.99181722	69.36233252	75.31130018	79.63541524
174–174.99 months	–0.634918779	53.91260737	0.18644163	39.28212045	40.73817116	43.15967355	47.76912213	53.91260737	61.4621711	69.85998897	75.82560968	80.16050495
175–175.99 months	–0.638083884	54.35127608	0.185662657	39.65508906	41.118509	43.55182054	48.18232356	54.35127608	61.92862037	70.35344811	76.33609688	80.68236046
176–176.99 months	–0.642028835	54.78676659	0.184874323	40.02862762	41.49895256	43.94334028	48.59365384	54.78676659	62.3909033	70.8425186	76.84263269	81.20090348
177–177.99 months	–0.646756013	55.21877657	0.184078567	40.40240687	41.8791711	44.33390178	49.00278873	55.21877657	62.84876169	71.32701026	77.34508562	81.71605007
178–178.99 months	–0.652262297	55.64701131	0.183277339	40.77608405	42.25882349	44.72316843	49.40940563	55.64701131	63.30194659	71.80673678	77.84332029	82.22770492
179–179.99 months	–0.658551638	56.07116407	0.182472427	41.14932239	42.63757221	45.1108035	49.81317566	56.07116407	63.75019486	72.2815034	78.33720309	82.73578555
180–180.99 months	–0.665609025	56.49095862	0.181665781	41.52175462	43.01505816	45.49646217	50.21378283	56.49095862	64.19327833	72.75113236	78.82658994	83.24017154
181–181.99 months	–0.673425951	56.90610886	0.18085918	41.89302144	43.39092788	45.87980164	50.61090716	56.90610886	64.63095632	73.21543801	79.31133801	83.74075385
182–182.99 months	–0.681987284	57.31634059	0.180054395	42.26275389	43.76482163	46.26047782	51.0042348	57.31634059	65.06300059	73.6742397	79.79129954	84.23740907
183–183.99 months	–0.691273614	57.72138846	0.179253153	42.63057829	44.13637714	46.63814737	51.39345743	57.72138846	65.48919135	74.12735965	80.26632286	84.73000377
184–184.99 months	–0.701261055	58.12099696	0.178457127	42.99611758	44.50523096	47.01246901	51.77827341	58.12099696	65.90931806	74.57462329	80.73625224	85.21839391
185–185.99 months	–0.711921092	58.51492143	0.177667942	43.3589927	44.87101979	47.3831047	52.15838887	58.51492143	66.32318017	75.01585966	81.20092786	85.70242429
186–186.99 months	–0.723218488	58.90293208	0.176887192	43.71882106	45.23337973	47.74972019	52.53352018	58.90293208	66.73059164	75.45090384	81.66018503	86.18192445
187–187.99 months	–0.735121189	59.28479948	0.176116307	44.07523324	45.59195858	48.11199053	52.90338872	59.28479948	67.13136309	75.87958721	82.11385795	86.65672655
188–188.99 months	–0.747580416	59.66032626	0.175356814	44.42784452	45.94639581	48.46959303	53.26773454	59.66032626	67.52533948	76.30175821	82.56177239	87.12662858
189–189.99 months	–0.760550666	60.02931704	0.174610071	44.77628678	46.29634576	48.82221709	53.62630488	60.02931704	67.91236375	76.71726244	83.00375329	87.59143077
190–190.99 months	–0.773984558	60.39158721	0.173877336	45.1202019	46.64147321	49.16956302	53.97885832	60.39158721	68.29228717	77.12594864	83.43962339	88.05092631
191–191.99 months	–0.787817728	60.74698785	0.173159953	45.45922209	46.98143987	49.51133821	54.32517625	60.74698785	68.66499835	77.5276843	83.8691966	88.50487158
192–192.99 months	–0.801993069	61.09536847	0.172459052	45.79300591	47.31593016	49.84726703	54.66504759	61.09536847	69.03037911	77.92233231	84.29228904	88.95303286
193–193.99 months	–0.816446409	61.43660077	0.171775726	46.12121938	47.64463827	50.17708708	54.9982797	61.43660077	69.38833214	78.30976593	84.70871297	89.39515827
194–194.99 months	–0.831110299	61.77057372	0.171110986	46.4435428	47.96727332	50.5005518	55.32469696	61.77057372	69.73877506	78.68986591	85.1182789	89.83098491
195–195.99 months	–0.845914498	62.09719399	0.170465756	46.75967279	48.2835611	50.81743186	55.64414166	62.09719399	70.08164061	79.0625209	85.52079616	90.26023965
196–196.99 months	–0.860786514	62.41638628	0.169840869	47.06932426	48.59324591	51.12751661	55.95647478	62.41638628	70.41687682	79.42762779	85.91607365	90.68264001
197–197.99 months	–0.875652181	62.72809362	0.169237063	47.37223239	48.89609218	51.43061537	56.26157681	62.72809362	70.74444713	79.78509216	86.30392061	91.09789536
198–198.99 months	–0.890436283	63.03227756	0.168654971	47.66815456	49.1918862	51.72655874	56.55934839	63.03227756	71.06433046	80.13482859	86.68414749	91.50570814
199–199.99 months	–0.905063185	63.32891841	0.168095124	47.9568721	49.4804377	52.01519982	56.8497111	63.32891841	71.3765212	80.47676112	87.0565669	91.90577541
200–200.99 months	–0.91945749	63.61801537	0.16755794	48.23819204	49.76158125	52.29641539	57.13260799	63.61801537	71.68102918	80.81082354	87.42099463	92.29779046
201–201.99 months	–0.933544683	63.89958662	0.167043722	48.5119486	50.03517772	52.57010692	57.40800416	63.89958662	71.97787966	81.1369598	87.77725073	92.6814447
202–202.99 months	–0.947251765	64.17366943	0.166552654	48.77800463	50.30111539	52.83620153	57.67588728	64.17366943	72.26711325	81.45512442	88.12516072	93.05642962
203–203.99 months	–0.960507855	64.44032016	0.166084798	49.03625275	50.55931105	53.09465275	57.93626794	64.44032016	72.54878582	81.76528289	88.46455683	93.42243904
204–204.99 months	–0.973244762	64.69961427	0.16564009	49.28661635	50.8097108	53.34544121	58.18918	64.69961427	72.82296841	82.06741212	88.79527942	93.77917145
205–205.99 months	–0.985397502	64.95164625	0.165218341	49.52905029	51.05229071	53.58857507	58.43468077	64.95164625	73.08974718	82.3615009	89.11717836	94.12633257
206–206.99 months	–0.996904762	65.1965295	0.164819236	49.76354136	51.28705716	53.82409032	58.67285105	65.1965295	73.34922324	82.64755047	89.43011463	94.46363806
207–207.99 months	–1.007705555	65.43440186	0.16444238	49.99010333	51.51404335	54.05204939	58.90379742	65.43440186	73.60151968	82.92557908	89.73396054	94.79080897
208–208.99 months	–1.017756047	65.66540015	0.164087103	50.2087994	51.73332523	54.27254708	59.1276417	65.66540015	73.84675041	83.19560496	90.02860798	95.10760779
209–209.99 months	–1.027002713	65.88970117	0.163752791	50.41970456	51.94499451	54.48570012	59.3445374	65.88970117	74.08507097	83.45767612	90.31395969	95.41378755
210–210.99 months	–1.035402243	66.10749114	0.163438661	50.62293176	52.14917717	54.69165364	59.55465678	66.10749114	74.31664141	83.71184998	90.58993909	95.70913474
211–211.99 months	–1.042916356	66.31897311	0.163143825	50.81862346	52.34602709	54.89057819	59.75819326	66.31897311	74.54163604	83.95819995	90.85649043	95.99346235
212–212.99 months	–1.049511871	66.52436618	0.162867311	51.00695001	52.53572455	55.08266832	59.95536025	66.52436618	74.76024322	84.19681638	91.11358115	96.26661385
213–213.99 months	–1.055160732	66.72390443	0.162608072	51.18810764	52.71847428	55.26814081	60.1463897	66.72390443	74.97266503	84.42780754	91.36120451	96.52846743
214–214.99 months	–1.059840019	66.91783563	0.162365006	51.36231608	52.89450319	55.44723255	60.33153027	66.91783563	75.17911684	84.6513007	91.59938232	96.77894046
215–215.99 months	–1.063531973	67.10641956	0.162136973	51.52981582	53.06405769	55.62019799	60.51104512	67.10641956	75.37982657	84.86744322	91.82816795	97.01799447
216–216.99 months	–1.066224038	67.28992603	0.161922819	51.69086489	53.22740059	55.78730622	60.68520928	67.28992603	75.57503388	85.07640364	92.04764958	97.24564034
217–217.99 months	–1.067908908	67.46863255	0.161721398	51.8457352	53.38480749	55.94883747	60.85430662	67.46863255	75.76498909	85.27837286	92.25795363	97.46194398
218–218.99 months	–1.068589885	67.64281378	0.16153153	51.99471665	53.53656883	56.10508206	61.0186237	67.64281378	75.94994171	85.47355853	92.4592488	97.66704065
219–219.99 months	–1.068261146	67.8127675	0.161352313	52.13808124	53.68296205	56.25632509	61.17845532	67.8127675	76.13017744	85.66221241	92.65174946	97.8611107

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
220–220.99 months	−1.066933756	67.97877331	0.161182785	52.27611902	53.82427723	56.402856	61.33408787	67.97877331	76.30596623	85.84459728	92.83571985	98.04442516
221–221.99 months	−1.064620976	68.14111022	0.161022184	52.4091082	53.96079321	56.54495425	61.48580086	68.14111022	76.47758936	86.02100855	93.0114792	98.21733128
222–222.99 months	−1.061341755	68.30004741	0.160869943	52.53731392	54.09277512	56.68288493	61.63385984	68.30004741	76.64533092	86.1917714	93.17940638	98.38026471
223–223.99 months	−1.057116957	68.4558454	0.160725793	52.66097508	54.22046291	56.81689002	61.77851223	68.4558454	76.80948323	86.35724712	93.33994398	98.53374986
224–224.99 months	−1.051988979	68.60872174	0.160589574	52.78032448	54.34408388	56.94718918	61.91996953	68.60872174	76.97030781	86.51781277	93.49360895	98.67844376
225–225.99 months	−1.04599033	68.75889263	0.1604617	52.89553346	54.46381004	57.073957	62.05841733	68.75889263	77.12809294	86.6739	93.64099003	98.8150862
226–226.99 months	−1.039168248	68.90653028	0.160342924	53.00673755	54.57977424	57.19732448	62.19399335	68.90653028	77.28310484	86.82596904	93.7827601	98.94455298
227–227.99 months	−1.031579574	69.05176427	0.160234478	53.11401756	54.69205355	57.31736613	62.32678127	69.05176427	77.43559533	86.97451776	93.91968135	99.06785516
228–228.99 months	−1.023291946	69.19467288	0.160138158	53.21738885	54.80065842	57.43408908	62.45680021	69.19467288	77.58579719	87.12008338	94.05261232	99.18615007
229–229.99 months	−1.014385118	69.33527376	0.160056393	53.31678976	54.90552089	57.54742113	62.58399337	69.33527376	77.73391919	87.26324432	94.18251529	99.30075287
230–230.99 months	−1.004952366	69.47351373	0.159992344	53.41206904	55.00648181	57.6571979	62.70821568	69.47351373	77.88014066	87.40462203	94.31046411	99.41314881
231–231.99 months	−0.995101924	69.60925782	0.159949989	53.50297229	55.10327703	57.7631489	62.8292204	69.60925782	78.02460556	87.54488282	94.43765234	99.5250061
232–232.99 months	−0.984958307	69.74227758	0.159934231	53.58912711	55.19552245	57.86488244	62.94664487	69.74227758	78.16741625	87.6847398	94.56540179	99.63818945
233–233.99 months	−0.974663325	69.87223885	0.159951004	53.67002691	55.28269761	57.96186944	63.0599953	69.87223885	78.30862691	87.82495478	94.69517136	99.75477412
234–234.99 months	−0.964376555	69.99868896	0.160007394	53.74501298	55.36412796	58.05342591	63.16863065	69.99868896	78.44823694	87.96634036	94.82856611	99.87706036
235–235.99 months	−0.954274945	70.12104381	0.160111769	53.8132547	55.43896526	58.13869414	63.27174585	70.12104381	78.58618425	88.10976202	94.96734651	100.0075883
236–236.99 months	−0.944551187	70.23857482	0.160273918	53.87372737	55.50616614	58.2166225	63.36835431	70.23857482	78.72233893	88.25614046	95.11343784	100.1491529
237–237.99 months	−0.935410427	70.35039626	0.160505203	53.92518731	55.56446839	58.28594368	63.45727001	70.35039626	78.85649725	88.40645399	95.26893942	100.3048189
238–238.99 months	−0.927059784	70.45546105	0.160818788	53.96613658	55.61235958	58.34514946	63.53709257	70.45546105	78.98838596	88.56174643	95.43613181	100.477926
239–239.99 months	−0.919718461	70.55252127	0.161229617	53.99481762	55.64806673	58.39247268	63.6061772	70.55252127	79.11762417	88.72311137	95.61749303	100.6721384
Girls												
24–24.99 months	−0.75220657	12.13455523	0.107740345	10.04880792	10.27482893	10.64075988	11.30566642	12.13455523	13.07613207	14.03902482	14.67658551	15.1183895
25–25.99 months	−0.78423366	12.2910249	0.10847701	10.17173432	10.40066415	10.77166654	11.44696728	12.2910249	13.25293458	14.24016506	14.89587242	15.35122084
26–26.99 months	−0.81409582	12.44469258	0.109280828	10.29079033	10.52273569	10.89898512	11.58501268	12.44469258	13.42753123	14.43983825	15.1142761	15.58362686
27–27.99 months	−0.841935504	12.59622335	0.110144488	10.40664383	10.64171007	11.02338047	11.72046615	12.59622335	13.60059358	14.63872906	15.33249457	15.8163176
28–28.99 months	−0.867889398	12.74620911	0.111060815	10.51990171	10.7581918	11.14545358	11.8539236	12.74620911	13.77271274	14.83743315	15.55113065	16.0499034
29–29.99 months	−0.892102647	12.89517218	0.112022759	10.63111516	10.8727282	11.26574591	11.98591692	12.89517218	13.94440383	15.03646393	15.770701	16.28490586
30–30.99 months	−0.914718817	13.04357164	0.113023467	10.74078194	10.98581228	11.38474303	12.11691911	13.04357164	14.11611337	15.23626013	15.99164336	16.52176469
31–31.99 months	−0.935876584	13.19180874	0.114056328	10.84934933	11.09788597	11.50287836	12.24734867	13.19180874	14.28822545	15.43719269	16.21432377	16.76084508
32–32.99 months	−0.955723447	13.34022934	0.115114953	10.95721927	11.2093447	11.62053698	12.37757256	13.34022934	14.46106492	15.63957012	16.43904429	17.00244749
33–33.99 months	−0.974383363	13.48913319	0.116193327	11.0647471	11.32053778	11.7380584	12.50791249	13.48913319	14.6349076	15.8436466	16.66604785	17.24680927
34–34.99 months	−0.991980756	13.63877446	0.11728575	11.17224778	11.43177357	11.85574032	12.63864672	13.63877446	14.80998135	16.04962601	16.89552564	17.49411514
35–35.99 months	−1.008640742	13.78936547	0.118386848	11.27999893	11.54332263	11.9738418	12.77001339	13.78936547	14.98647034	16.25766706	17.12762297	17.74450372
36–36.99 months	−1.024471278	13.94108332	0.119491669	11.38824099	11.65541879	12.0925858	12.90221529	13.94108332	15.16452247	16.46788956	17.3624437	17.9980699
37–37.99 months	−1.039573604	14.09407175	0.120595658	11.49718137	11.76826286	12.21216229	13.03542218	14.09407175	15.34425164	16.68037834	17.60005585	18.25487219
38–38.99 months	−1.054039479	14.24844498	0.121694676	11.60699649	11.88202491	12.33273088	13.16977393	14.24844498	15.52574208	16.89518784	17.84049621	18.51493707
39–39.99 months	−1.067946784	14.40429169	0.12278503	11.71783343	11.99684628	12.45442324	13.3053838	14.40429169	15.7090529	17.11234657	18.08377443	18.77826268
40–40.99 months	−1.081374153	14.56167529	0.1238634	11.82981465	12.11284345	12.57734604	13.44233976	14.56167529	15.89421842	17.33185956	18.329878	19.04482627
41–41.99 months	−1.094381409	14.72064045	0.124926943	11.94303682	12.23010816	12.7015826	13.58070885	14.72064045	16.08125551	17.55371382	18.57877485	19.31458378
42–42.99 months	−1.107021613	14.88121352	0.125973221	12.05757491	12.34871076	12.82719552	13.72053844	14.88121352	16.27016402	17.77788046	18.83041754	19.58747608
43–43.99 months	−1.119338692	15.04340553	0.127000212	12.17348363	12.46870194	12.95422865	13.86185877	15.04340553	16.4609302	18.00431807	19.08474635	19.86343169
44–44.99 months	−1.131367831	15.20721443	0.128006292	12.29079939	12.59011469	13.08270906	14.00468502	15.20721443	16.65352914	18.23297548	19.34169227	20.14236985
45–45.99 months	−1.143135936	15.37262729	0.128990225	12.40954207	12.71296607	13.21264896	14.14901929	15.37262729	16.84792719	18.46379435	19.60117968	20.42420335
46–46.99 months	−1.15466215	15.53962221	0.129951143	12.52971675	12.837259	13.3440474	14.29485248	15.53962221	17.04408407	18.69671155	19.86312888	20.70884106
47–47.99 months	−1.165958392	15.70817017	0.130888527	12.65131534	12.96298387	13.47689199	14.44216593	15.70817017	17.24195488	18.9316613	20.12745836	20.99619028
48–48.99 months	−1.177029925	15.87823668	0.131802186	12.77431816	13.09012012	13.61116044	14.59093307	15.87823668	17.44149184	19.16857713	20.3940868	21.28615884
49–49.99 months	−1.187871001	16.04978452	0.132692269	12.89869431	13.21863694	13.74682181	14.74112146	16.04978452	17.64264736	19.40739437	20.66293462	21.57865549
50–50.99 months	−1.198484073	16.2227706	0.133559108	13.0244072	13.34849756	13.88383882	14.89269209	16.2227706	17.84537017	19.64804889	20.93392691	21.8735972

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
51–51.99 months	−1.208853947	16.39715363	0.134403386	13.15141009	13.47965651	14.02216781	15.04560355	16.39715363	18.04961414	19.8904825	21.20699305	22.17090276
52–52.99 months	−1.218965087	16.57289122	0.13522599	13.279651	13.61206342	14.16176079	15.19981137	16.57289122	18.25533469	20.13464164	21.48206912	22.47049907
53–53.99 months	−1.228798212	16.74994187	0.136028014	13.40907302	13.74566354	14.30256641	15.35526953	16.74994187	18.46249096	20.38047905	21.75909881	22.7723211
54–54.99 months	−1.238330855	16.92826587	0.136810739	13.53961547	13.88039891	14.44453095	15.51193144	16.92826587	18.67104666	20.62795467	22.0380343	23.07631287
55–55.99 months	−1.247537914	17.10782615	0.137575606	13.67121491	14.0162093	14.58759933	15.66975084	17.10782615	18.88097086	20.87703643	22.31883709	23.3824283
56–56.99 months	−1.256392179	17.28858894	0.138324193	13.80380614	14.15303322	14.731716	15.82868259	17.28858894	19.09223862	21.12770084	22.60147865	23.69063187
57–57.99 months	−1.264864846	17.47052444	0.139058192	13.9373231	14.29080875	14.87682577	15.9886834	17.47052444	19.30483153	21.37993353	22.88594093	24.00089913
58–58.99 months	−1.272926011	17.65360733	0.139779387	14.07169977	14.42947441	15.02287453	16.14971251	17.65360733	19.51873814	21.63372961	23.17221677	24.31321719
59–59.99 months	−1.28054514	17.83781722	0.140489635	14.20687088	14.56896986	15.16981002	16.31173224	17.83781722	19.73395429	21.88909396	23.46031012	24.62758492
60–60.99 months	−1.287691525	18.02313904	0.141190842	14.34277271	14.70923661	15.31758235	16.47470852	18.02313904	19.95048336	22.14604136	23.75023626	24.94401317
61–61.99 months	−1.294332076	18.20956418	0.141884974	14.47934293	14.85021811	15.46614444	16.63861163	18.20956418	20.16833747	22.40459718	24.04202158	25.26252369
62–62.99 months	−1.300441561	18.3970876	0.142573939	14.61652406	14.9918623	15.61545325	16.80341543	18.3970876	20.38753372	22.66479513	24.33570429	25.5831532
63–63.99 months	−1.305989011	18.58571243	0.143259709	14.75426001	15.13411929	15.76546914	16.96909934	18.58571243	20.60809964	22.92668027	24.63133325	25.90594748
64–64.99 months	−1.310946941	18.77544728	0.143944216	14.89249907	15.27694359	15.91615695	17.13564756	18.77544728	20.83006969	23.19030686	24.92896835	26.23096473
65–65.99 months	−1.315289534	18.966307	0.144629359	15.03119376	15.42029408	16.06748615	17.30304956	18.966307	21.05348599	23.45573857	25.22868007	26.55827443
66–66.99 months	−1.318992925	19.15831267	0.14531699	15.17030121	15.56413437	16.21943117	17.4713002	19.15831267	21.27839816	23.72304816	25.5305491	26.88795694
67–67.99 months	−1.322035315	19.35149163	0.146008903	15.30978338	15.70843301	16.37197155	17.64039992	19.35149163	21.50486316	23.99231712	25.83466581	27.2201029
68–68.99 months	−1.324398133	19.54587708	0.146706813	15.4496077	15.85316397	16.52509225	17.81035463	19.54587708	21.7329446	24.263635	26.14112991	27.55481321
69–69.99 months	−1.326064539	19.74150854	0.147412363	15.5897467	15.99830645	16.67878363	17.98117606	19.74150854	21.96271325	24.53709941	26.45004964	27.89219758
70–70.99 months	−1.327020415	19.93843145	0.148127109	15.73017845	16.1438452	16.83304163	18.15288153	19.93843145	22.19424627	24.8128152	26.76154129	28.2323743
71–71.99 months	−1.327256387	20.13669623	0.148852482	15.87088741	16.28977109	16.98786798	18.32549376	20.13669623	22.42762598	25.09089343	27.07572865	28.57547042
72–72.99 months	−1.326763834	20.33635961	0.149589838	16.01186303	16.43608019	17.14326985	18.49904125	20.33635961	22.66294138	25.3714519	27.39274198	28.92161906
73–73.99 months	−1.325538668	20.53748298	0.1503404	16.15310112	16.58277468	17.29926017	18.67355775	20.53748298	22.90028597	25.65461346	27.71271759	29.27096042
74–74.99 months	−1.323579654	20.74013277	0.151105277	16.29460329	16.72986243	17.4558574	18.84908224	20.74013277	23.13975807	25.94050589	28.03579694	29.62364011
75–75.99 months	−1.320888012	20.94438028	0.151885464	16.43637669	16.87735682	17.61308542	19.02565892	20.94438028	23.38146064	26.22926131	28.36212579	29.97980811
76–76.99 months	−1.317468695	21.15030093	0.152681819	16.57843458	17.02527707	17.77097356	19.20333679	21.15030093	23.62550009	26.52101516	28.69185351	30.33961853
77–77.99 months	−1.313331446	21.35797332	0.15349505	16.72079656	17.17364841	17.92955656	19.38216922	21.35797332	23.87198507	26.815905	29.02513239	30.70322948
78–78.99 months	−1.308487081	21.56748045	0.154325756	16.86348713	17.32250091	18.08887399	19.56221428	21.56748045	24.12102802	27.11407112	29.36211644	31.07080008
79–79.99 months	−1.302948173	21.77890902	0.155174414	17.00653572	17.47186953	18.24897012	19.74353436	21.77890902	24.37274421	27.41565556	29.70296069	31.44248988
80–80.99 months	−1.296733913	21.99234686	0.15604132	17.14997871	17.62179544	18.40989435	19.92619507	21.99234686	24.62724833	27.72079958	30.04782073	31.81846107
81–81.99 months	−1.289863329	22.20788541	0.156926667	17.2938564	17.77232382	18.57170012	20.110266	22.20788541	24.88465774	28.02964533	30.39685131	32.19887352
82–82.99 months	−1.282358762	22.4256177	0.157830504	17.43821437	17.92350474	18.73444512	20.29581981	22.4256177	25.14508981	28.3423338	30.75020585	32.58388611
83–83.99 months	−1.274244931	22.64563824	0.158752743	17.58310295	18.07539265	18.89819089	20.48293203	22.64563824	25.40866182	28.65900443	31.10803553	32.97365535
84–84.99 months	−1.265548787	22.86804258	0.159693163	17.72857693	18.2280462	19.06300261	20.67168066	22.86804258	25.67549032	28.97979428	31.47048848	33.3683346
85–85.99 months	−1.256299378	23.09292679	0.16065141	17.87469542	18.38152794	19.22894873	20.86214582	23.09292679	25.94569055	29.30483741	31.83770901	33.76807319
86–86.99 months	−1.24653066	23.32038549	0.161626956	18.02152302	18.53590513	19.39610118	21.05440884	23.32038549	26.21937378	29.63426278	32.2098371	34.17301785
87–87.99 months	−1.236266832	23.55051871	0.162619308	18.16912246	18.69124428	19.56453273	21.24855446	23.55051871	26.49665657	29.96819988	32.58700628	34.5833014
88–88.99 months	−1.225551344	23.78341652	0.1636276	18.31756871	18.84762137	19.73432134	21.44466518	23.78341652	26.77764034	30.30676532	32.96934568	34.99906317
89–89.99 months	−1.214410914	24.01917703	0.1646511	18.46693089	19.00510849	19.90554403	21.64282737	24.01917703	27.06243533	30.65007797	33.35697585	35.42042208
90–90.99 months	−1.202884389	24.25789074	0.165688808	18.61728653	19.16378421	20.07828129	21.84312554	24.25789074	27.35113996	30.99824532	33.75001097	35.84749737
91–91.99 months	−1.191007906	24.49964778	0.166739662	18.76871394	19.32372789	20.25261432	22.04564463	24.49964778	27.64385046	31.3513695	34.14855665	36.28039703
92–92.99 months	−1.178818621	24.74453536	0.167802495	18.92129383	19.48502077	20.42862531	22.25046892	24.74453536	27.94065757	31.70954484	34.55270981	36.71922013
93–93.99 months	−1.166354376	24.99263735	0.168876037	19.07510898	19.64774563	20.60639712	22.45768158	24.99263735	28.24164611	32.07285742	34.96255799	37.16405609
94–94.99 months	−1.153653688	25.24403371	0.169958922	19.23024402	19.8119865	20.7860129	22.6673643	25.24403371	28.54689431	32.44138436	35.37817885	37.61498429
95–95.99 months	−1.140751404	25.49880264	0.171049756	19.38678267	19.9778266	20.96755499	22.87959773	25.49880264	28.85647669	32.81519554	35.79963916	38.07206991
96–96.99 months	−1.127684095	25.7570168	0.172147043	19.54481057	20.14535023	21.15110555	23.09445998	25.7570168	29.17045929	33.19435025	36.2269949	38.53536809
97–97.99 months	−1.114490244	26.01874261	0.173249185	19.70441527	20.31464276	21.33674635	23.31202608	26.01874261	29.4888987	33.5788965	36.66029091	39.00492396
98–98.99 months	−1.101204848	26.28404312	0.174354569	19.86568272	20.48578791	21.52455736	23.53236883	26.28404312	29.8118461	33.9688734	37.09955982	39.48076746
99–99.99 months	−1.087863413	26.55297507	0.175461512	20.02869944	20.65886924	21.71461721	23.75555744	26.55297507	30.13934341	34.3643086	37.54482215	39.96291669

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
100–100.99 months	−1.074500927	26.82558904	0.176568284	20.19355165	20.83396942	21.90700268	23.98165745	26.82558904	30.47142364	34.76521834	37.99608589	40.45137672
101–101.99 months	−1.061151213	27.1019295	0.177673124	20.36032458	21.01116968	22.10178826	24.21073043	27.1019295	30.80811106	35.17160751	38.45334608	40.94613881
102–102.99 months	−1.047847141	27.38203422	0.178774242	20.52910239	21.19054959	22.29904589	24.44283365	27.38203422	31.14942058	35.58346914	38.91658465	41.44718044
103–103.99 months	−1.034620551	27.66593402	0.179869829	20.6999678	21.37218677	22.49884459	24.67801969	27.66593402	31.49535747	36.00078421	39.38577014	41.95446506
104–104.99 months	−1.021502197	27.9536524	0.180958063	20.8730018	21.55615653	22.7012502	24.9163362	27.9536524	31.8459171	36.42352136	39.86085756	42.46794195
105–105.99 months	−1.008521695	28.24520531	0.182037118	21.04828336	21.74253164	22.90632506	25.15782551	28.24520531	32.20108468	36.85163675	40.3417882	42.98754609
106–106.99 months	−0.995707494	28.54060085	0.183105172	21.22588911	21.93138197	23.1141277	25.40252443	28.54060085	32.56083507	37.28507392	40.82848957	43.51319807
107–107.99 months	−0.983086844	28.83983907	0.18416041	21.40589307	22.12277423	23.32471257	25.65046392	28.83983907	32.92513255	37.72376365	41.32087531	44.04480409
108–108.99 months	−0.970685789	29.14291171	0.185201039	21.58836636	22.31677169	23.53812979	25.90166889	29.14291171	33.29393074	38.16762389	41.8188452	44.58225593
109–109.99 months	−0.958529157	29.44980208	0.186225287	21.77337689	22.51343388	23.75442484	26.15615792	29.44980208	33.66717239	38.61655976	42.32228515	45.12543098
110–110.99 months	−0.946640568	29.76048479	0.187231416	21.96098914	22.71281638	23.97363834	26.41394306	29.76048479	34.04478937	39.0704635	42.83106725	45.67419242
111–111.99 months	−0.935042447	30.0749257	0.188217723	22.15126389	22.91497052	24.19580583	26.67502964	30.0749257	34.42670255	39.52921454	43.34504991	46.22838923
112–112.99 months	−0.923756041	30.39308176	0.18918255	22.34425792	23.11994316	24.4209575	26.93941607	30.39308176	34.8128218	39.99267955	43.86407795	46.78785646
113–113.99 months	−0.912801445	30.71490093	0.190124286	22.54002382	23.32777646	24.64911804	27.20709368	30.71490093	35.20304599	40.46071256	44.38798278	47.3524154
114–114.99 months	−0.902197638	31.0403221	0.191041375	22.73860975	23.53850764	24.88030638	27.47804659	31.0403221	35.59726302	40.9331551	44.91658265	47.92187383
115–115.99 months	−0.891962513	31.36927506	0.191932319	22.94005917	23.7521688	25.11453557	27.75225159	31.36927506	35.99534989	41.40983639	45.44968284	48.49602631
116–116.99 months	−0.882112919	31.7016805	0.192795682	23.14441069	23.96878672	25.35181259	28.029678	31.7016805	36.3971728	41.89057352	45.98707597	49.07465451
117–117.99 months	−0.872664706	32.03744999	0.193630095	23.35169781	24.18838263	25.59213818	28.31028765	32.03744999	36.80258726	42.37517172	46.52854232	49.65752758
118–118.99 months	−0.863632768	32.37648607	0.19443426	23.56194878	24.4109721	25.83550673	28.59403476	32.37648607	37.21143829	42.86342465	47.07385017	50.24440253
119–119.99 months	−0.855031092	32.71868225	0.195206948	23.77518637	24.63656488	26.08190616	28.88086594	32.71868225	37.62356058	43.35511467	47.62275619	50.83502464
120–120.99 months	−0.846872805	33.06392318	0.195947008	23.99142774	24.86516468	26.33131782	29.17072015	33.06392318	38.03877869	43.85001322	48.17500585	51.42912799
121–121.99 months	−0.839170224	33.4120847	0.196653365	24.21068424	25.09676913	26.58371638	29.4635287	33.4120847	38.45690737	44.34788119	48.73033386	52.02643587
122–122.99 months	−0.831934903	33.76303402	0.197325023	24.43296131	25.33136962	26.8390698	29.7592153	33.76303402	38.87775177	44.84846931	49.28846466	52.62666135
123–123.99 months	−0.825177688	34.1166299	0.197961065	24.65825833	25.56895119	27.09733925	30.05769609	34.1166299	39.30110778	45.35151857	49.84911291	53.22950783
124–124.99 months	−0.818908758	34.47272283	0.198560655	24.88656847	25.80949245	27.35847906	30.35887971	34.47272283	39.72676238	45.8567607	50.41198402	53.8346696
125–125.99 months	−0.813137675	34.83115524	0.199123037	25.11787864	26.05296553	27.62243677	30.66266737	34.83115524	40.15449395	46.36391866	50.9767747	54.44183245
126–126.99 months	−0.807873433	35.19176177	0.199647538	25.35216934	26.29933598	27.88915304	30.96895298	35.19176177	40.58407272	46.87270712	51.54317357	55.0506743
127–127.99 months	−0.803122613	35.55437176	0.200133598	25.58941249	26.5485612	28.15856107	31.27762411	35.55437176	41.01526401	47.38283479	52.11086123	55.66086287
128–128.99 months	−0.79889771	35.91879976	0.200580618	25.82958069	26.80059725	28.43058954	31.58855853	35.91879976	41.44781609	47.89399722	52.67951305	56.27206944
129–129.99 months	−0.795203499	36.28486194	0.200988216	26.0726318	27.05538753	28.70515783	31.90163028	36.28486194	41.88148136	48.40589011	53.2487963	56.88394797
130–130.99 months	−0.792047959	36.65236365	0.201356017	26.31852113	27.31287184	28.98217994	32.21670522	36.65236365	42.31600037	48.91819978	53.81837358	57.49615297
131–131.99 months	−0.789435274	37.02110818	0.201683791	26.56719327	27.57298031	29.26156199	32.5336442	37.02110818	42.75111318	49.43061053	54.38790173	58.10832895
132–132.99 months	−0.787374433	37.39088668	0.201971282	26.81859231	27.83564104	29.5432056	32.85229967	37.39088668	43.18654635	49.94279684	54.95703466	58.72012509
133–133.99 months	−0.785870695	37.76148905	0.202218375	27.0726516	28.10077256	29.82700474	33.17251956	37.76148905	43.62202704	50.45443246	55.52542195	59.33118206
134–134.99 months	−0.784929893	38.1326991	0.202425006	27.3292989	28.3682877	30.11284746	33.49414573	38.1326991	44.05727678	50.96518685	56.0927106	59.94113978
135–135.99 months	−0.784557605	38.50429603	0.202591183	27.5884554	28.63809288	30.4006158	33.81701463	38.50429603	44.49201341	51.47472671	56.65854557	60.54963673
136–136.99 months	−0.78475917	38.87605489	0.20271698	27.85003573	28.91008824	30.69018587	34.14095759	38.87605489	44.92595166	51.98271665	57.22257051	61.15631078
137–137.99 months	−0.785539703	39.24774707	0.202802535	28.11394809	29.18416775	30.98142809	34.46580111	39.24774707	45.35880379	52.48881992	57.78442851	61.76079992
138–138.99 months	−0.786904102	39.61914076	0.202848049	28.38009427	29.46021931	31.27420739	34.79136727	39.61914076	45.79028017	52.99269914	58.34376285	62.36274309
139–139.99 months	−0.788858208	39.98999994	0.202853758	28.64837137	29.73812611	31.56838398	35.11747352	39.98999994	46.22008796	53.49401569	58.90021802	62.96178288
140–140.99 months	−0.791403051	40.36009244	0.202820053	28.91866389	30.01776074	31.8638107	35.44393549	40.36009244	46.64794172	53.99243685	59.45343918	63.55755646
141–141.99 months	−0.794546352	40.72917544	0.202747236	29.1908599	30.29899746	32.16033905	35.77056256	40.72917544	47.07354407	54.48762378	60.00307549	64.14971608
142–142.99 months	−0.79829102	41.09701099	0.202635758	29.46483511	30.58170029	32.45781366	36.09716305	41.09701099	47.4966064	54.97924502	60.5487783	64.73791012
143–143.99 months	−0.802640891	41.46335907	0.202486098	29.74046108	30.86572924	32.75607548	36.4235422	41.46335907	47.91683947	55.4669708	61.09020319	65.32179369
144–144.99 months	−0.807599577	41.82797963	0.202298783	30.01760377	31.15093935	33.05496144	36.7495031	41.82797963	48.33395608	55.9504751	61.62701045	65.90102746
145–145.99 months	−0.813170461	42.19063313	0.202074385	30.29612378	31.43718091	33.35430482	37.07484703	42.19063313	48.74767177	56.42943635	62.15886584	66.47527837
146–146.99 months	−0.819356692	42.55108107	0.201813521	30.57587654	31.72429973	33.6539355	37.39937399	42.55108107	49.15770541	56.90353811	62.68544133	67.04422046
147–147.99 months	−0.826161176	42.90908653	0.201516851	30.85671255	32.01213742	33.95368036	37.72288302	42.90908653	49.56377988	57.37246984	63.20641583	67.60753554
148–148.99 months	−0.833586038	43.2644155	0.201185082	31.13847695	32.30053116	34.25336333	38.04517298	43.2644155	49.96562365	57.83592807	63.72147556	68.16491273

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
149–149.99 months	–0.841634949	43.61683402	0.200818928	31.42101289	32.58931625	34.55280676	38.36604173	43.61683402	50.36296721	58.29361488	64.2303163	68.7160548
150–150.99 months	–0.850307441	43.9661169	0.200419208	31.70415418	32.87832086	34.85182934	38.68528952	43.9661169	50.75555403	58.74524431	64.73264089	69.26066574
151–151.99 months	–0.859607525	44.31203579	0.199986681	31.98773757	33.16737518	35.15025041	39.0027151	44.31203579	51.14312509	59.19053344	65.22816347	69.7984699
152–152.99 months	–0.869534339	44.65437319	0.199522233	32.27158972	33.45630184	35.44788577	39.31812066	44.65437319	51.52543729	59.62921442	65.7166078	70.32919455
153–153.99 months	–0.880088651	44.99291356	0.199026736	32.55553716	33.74492348	35.74455149	39.63130927	44.99291356	51.90225139	60.06102656	66.19770861	70.85258197
154–154.99 months	–0.891270585	45.32744704	0.198501096	32.83940314	34.03306041	36.04006296	39.94208624	45.32744704	52.273337	60.48572025	66.67121259	71.36838696
155–155.99 months	–0.903079458	45.65777013	0.197946255	33.12300797	34.3205311	36.33423538	40.25025974	45.65777013	52.63847339	60.90305741	67.13687835	71.87637634
156–156.99 months	–0.915513542	45.98368656	0.197363191	33.40616909	34.60715224	36.62688403	40.55564134	45.98368656	52.99745045	61.31281247	67.59447719	72.37632936
157–157.99 months	–0.928569454	46.30500858	0.196752931	33.68870064	34.89273857	36.91782442	40.85804669	46.30500858	53.35007037	61.71477365	68.04379345	72.86803693
158–158.99 months	–0.942245864	46.62155183	0.196116472	33.97041915	35.17710718	37.20687443	41.15729406	46.62155183	53.69614073	62.10873877	68.4846261	73.35131006
159–159.99 months	–0.956537923	46.93314404	0.19545489	34.25113618	35.46007223	37.49385217	41.45320759	46.93314404	54.03548596	62.49452276	68.91678763	73.82596855
160–160.99 months	–0.971440492	47.23962058	0.194769279	34.5306634	35.74144871	37.77857793	41.74561603	47.23962058	54.36794129	62.87195405	69.34010551	74.2918484
161–161.99 months	–0.986947308	47.54082604	0.194060758	34.80881186	36.0210521	38.06087423	42.03435353	47.54082604	54.69335479	63.24087599	69.75442235	74.74880046
162–162.99 months	–1.003050887	47.83661466	0.193330477	35.08539244	36.29869877	38.34056621	42.31926009	47.83661466	55.01158787	63.60114743	70.15959636	75.19669066
163–163.99 months	–1.019742425	48.12685082	0.192579614	35.36021624	36.57420636	38.61748204	42.60018191	48.12685082	55.32251577	63.95264314	70.55550168	75.63540025
164–164.99 months	–1.037011698	48.41140938	0.191809374	35.63309497	36.84739419	38.89145331	42.87697183	48.41140938	55.62602801	64.29525433	70.94202872	76.0648259
165–165.99 months	–1.054846957	48.69017613	0.191020995	35.90384139	37.11808367	39.16231542	43.14948969	48.69017613	55.9220288	64.62888901	71.31908448	76.48487978
166–166.99 months	–1.073234825	48.9630481	0.190215739	36.17226975	37.38609874	39.42990799	43.4176027	48.9630481	56.21043748	64.95347244	71.68659282	76.8954897
167–167.99 months	–1.092160195	49.22993391	0.189394901	36.43819618	37.65126622	39.69407521	43.68118578	49.22993391	56.49118881	65.26894746	72.04449469	77.29659902
168–168.99 months	–1.111606122	49.49075409	0.188559804	36.70143915	37.91341628	39.95466626	43.94012186	49.49075409	56.76423337	65.57527484	72.39274832	77.68816668
169–169.99 months	–1.131553723	49.74544132	0.187711798	36.96181994	38.17238283	40.21153565	44.19430225	49.74544132	57.02953776	65.87243353	72.73132942	78.0701671
170–170.99 months	–1.151982079	49.99394068	0.186852266	37.21916305	38.42800396	40.4645436	44.4436269	49.99394068	57.2870849	66.16042095	73.06023127	78.44259001
171–171.99 months	–1.172868141	50.23620985	0.185982617	37.47329665	38.68012233	40.71355642	44.68800466	50.23620985	57.53687418	66.43925318	73.37946482	78.80544037
172–172.99 months	–1.19418462	50.47222213	0.185104331	37.72405025	38.92858345	40.95844577	44.92735442	50.47222213	57.77892568	66.70896797	73.68905842	79.15873364
173–173.99 months	–1.215907492	50.70195581	0.184218803	37.97126574	39.17324412	41.19909297	45.16160204	50.70195581	58.01326503	66.96961412	73.98905915	79.5025122
174–174.99 months	–1.238005268	50.92540942	0.183327556	38.2147829	39.41396159	41.4353838	45.39068521	50.92540942	58.23994486	67.22126661	74.27953085	79.83682168
175–175.99 months	–1.260445591	51.14259229	0.182432113	38.45444923	39.65060094	41.66721226	45.61455072	51.14259229	58.45903143	67.46401722	74.5605553	80.16172522
176–176.99 months	–1.283193626	51.3535268	0.181534018	38.69011819	39.8830339	41.89448008	45.83315528	51.3535268	58.67060766	67.69797665	74.83223179	80.47729968
177–177.99 months	–1.306212032	51.55824831	0.180634839	38.92164966	40.11113919	42.11709702	46.0464657	51.55824831	58.87477302	67.92327441	75.09467698	80.78363524
178–178.99 months	–1.329460945	51.75680513	0.179736168	39.14891037	40.33480295	42.33498116	46.25445894	51.75680513	59.07164337	68.14005866	75.34802466	81.08083497
179–179.99 months	–1.35289798	51.94925841	0.178839614	39.37177435	40.55391906	42.54805916	46.45712228	51.94925841	59.26135066	68.34849595	75.5924255	81.36901438
180–180.99 months	–1.376478254	52.13568193	0.177946804	39.59012338	40.76838955	42.7562665	46.65445329	52.13568193	59.44404265	68.5487709	75.82804673	81.64830091
181–181.99 months	–1.400154426	52.31616197	0.177059379	39.80384736	40.97812493	42.95954776	46.84645992	52.31616197	59.61988254	68.74108582	76.05507182	81.91883344
182–182.99 months	–1.423876772	52.49079703	0.17617899	40.01284477	41.18304453	43.1578568	47.03316051	52.49079703	59.78904852	68.92566027	76.27369999	82.18076174
183–183.99 months	–1.447593267	52.65969757	0.175307296	40.21702302	41.3830768	43.35115698	47.21458375	52.65969757	59.95173329	69.10273048	76.48414576	82.43424593
184–184.99 months	–1.471249702	52.82298572	0.174445958	40.41629881	41.57815964	43.53942133	47.39076866	52.82298572	60.10814351	69.27254876	76.68663841	82.67945587
185–185.99 months	–1.494789826	52.9807949	0.173596636	40.61059851	41.76824065	43.72263271	47.56176451	52.9807949	60.25849917	69.43538282	76.88142138	82.91657062
186–186.99 months	–1.518155513	53.13326946	0.172760982	40.79985847	41.95327736	43.90078396	47.72763073	53.13326946	60.40303292	69.59151495	77.06875157	83.1457778
187–187.99 months	–1.541286949	53.28056425	0.17194064	40.98402528	42.1332375	44.07387796	47.8884368	53.28056425	60.54198938	69.74124122	77.24889863	83.36727297
188–188.99 months	–1.564122852	53.42284417	0.171137232	41.16305606	42.30809914	44.24192774	48.04426208	53.42284417	60.67562433	69.8848705	77.42214413	83.581259
189–189.99 months	–1.586600712	53.5602837	0.170352363	41.33691866	42.4778509	44.40495652	48.19519564	53.5602837	60.80420388	70.0227235	77.58878071	83.78794544
190–190.99 months	–1.608657054	53.69306637	0.169587605	41.50559186	42.642492	44.5629977	48.34133606	53.69306637	60.92800363	70.15513163	77.74911109	83.98754779
191–191.99 months	–1.630227728	53.82138422	0.168844497	41.66906547	42.80203238	44.71609485	48.4827912	53.82138422	61.04730771	70.28243588	77.90344707	84.18028693
192–192.99 months	–1.651248208	53.94543725	0.168124538	41.82734048	42.95649273	44.86430165	48.6196779	53.94543725	61.16240788	70.40498554	78.05210841	84.36638832
193–193.99 months	–1.67165392	54.06543278	0.167429179	41.98042905	43.10590449	45.00768175	48.7521217	54.06543278	61.27360245	70.52313696	78.19542171	84.54608137
194–194.99 months	–1.691380583	54.18158486	0.166759816	42.12835452	43.25030973	45.14630867	48.88025651	54.18158486	61.38119533	70.63725215	78.33371911	84.71959869
195–195.99 months	–1.710364557	54.29411356	0.166117788	42.27115134	43.38976112	45.28026556	49.0042242	54.29411356	61.48549489	70.74769732	78.46733702	84.88717537
196–196.99 months	–1.728543207	54.40324431	0.165504365	42.40886495	43.52432169	45.40964499	49.12417422	54.40324431	61.58681291	70.85484146	78.59661472	85.04904822
197–197.99 months	–1.745855274	54.50920717	0.164920747	42.54155162	43.65406467	45.5345486	49.24026312	54.50920717	61.68546339	70.95905471	78.72189292	85.205455

Table 22. *L, M,* and *S* parameters and selected smoothed percentiles for weight (in kilograms) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
198–198.99 months	−1.762241248	54.61223603	0.164368054	42.66927817	43.77907316	45.65508683	49.35265405	54.61223603	61.7817614	71.06070688	78.84351231	85.35663368
199–199.99 months	−1.777643747	54.71256787	0.16384732	42.79212167	43.89943983	45.77137845	49.46151622	54.71256787	61.87602186	71.16016568	78.96181194	85.50282159
200–200.99 months	−1.792007891	54.81044184	0.163359491	42.91016914	44.01526649	45.88355015	49.5670243	54.81044184	61.96855832	71.25779513	79.07712765	85.64425466
201–201.99 months	−1.805281675	54.90609842	0.162905415	43.02351704	44.12666366	45.99173597	49.66935776	54.90609842	62.05968162	71.35395381	79.18979044	85.78116658
202–202.99 months	−1.817416335	54.99977846	0.162485839	43.13227083	44.23375003	46.09607679	49.76870017	54.99977846	62.14969862	71.44899305	79.30012477	85.91378798
203–203.99 months	−1.828366707	55.09172217	0.162101402	43.23654442	44.33665192	46.19671962	49.86523842	55.09172217	62.23891075	71.54325519	79.40844685	86.04234557
204–204.99 months	−1.838091576	55.18216811	0.161752634	43.33645956	44.43550259	46.29381699	49.95916191	55.18216811	62.32761268	71.63707172	79.51506292	86.16706131
205–205.99 months	−1.846554015	55.271352	0.161439944	43.43214518	44.53044156	46.38752609	50.05066163	55.271352	62.41609075	71.73076142	79.62026752	86.28815157
206–206.99 months	−1.853721704	55.35950558	0.161163623	43.52373663	44.62161386	46.47800802	50.13992923	55.35950558	62.50462147	71.82462845	79.72434173	86.40582627
207–207.99 months	−1.859567242	55.44685531	0.160923833	43.61137495	44.70916923	46.56542689	50.22715595	55.44685531	62.59346994	71.91896047	79.82755144	86.52028803
208–208.99 months	−1.864068443	55.53362107	0.160720609	43.69520604	44.79326117	46.64994883	50.31253151	55.53362107	62.68288814	72.01402668	79.9301456	86.63173131
209–209.99 months	−1.86720861	55.62001464	0.16055385	43.77537971	44.8740461	46.73174101	50.39624297	55.62001464	62.77311319	72.11007585	80.03235456	86.74034162
210–210.99 months	−1.8689768	55.70623826	0.160423319	43.85204883	44.95168231	46.81097052	50.47847336	55.70623826	62.86436555	72.20733438	80.13438837	86.84629466
211–211.99 months	−1.869371157	55.79247939	0.160328578	43.9253721	45.02633189	46.88780489	50.55939966	55.79247939	62.95684135	72.3059993	80.23643485	86.9497625
212–212.99 months	−1.868386498	55.87892356	0.160269232	43.99549743	45.09814744	46.96240411	50.6391944	55.87892356	63.05073398	72.40625667	80.33865934	87.05088422
213–213.99 months	−1.866033924	55.96573022	0.160244549	44.06258481	45.16728964	47.03492965	50.71801935	55.96573022	63.14619584	72.50824833	80.44120111	87.14980899
214–214.99 months	−1.862327775	56.05304601	0.160253714	44.12678882	45.23391322	47.10553608	50.79602716	56.05304601	63.24336091	72.61209121	80.54417335	87.24666536
215–215.99 months	−1.857289195	56.14099882	0.160295765	44.18826162	45.29816896	47.17437139	50.87335876	56.14099882	63.34233618	72.71786996	80.64766146	87.34156823
216–216.99 months	−1.850946286	56.22969564	0.16036959	44.24715174	45.36020233	47.24157543	50.95014153	56.22969564	63.44319934	72.82563495	80.75172168	87.43461808
217–217.99 months	−1.84333425	56.3192203	0.16047393	44.30360275	45.42015206	47.30727836	51.02648735	56.3192203	63.54599643	72.93540037	80.85638	87.52590032
218–218.99 months	−1.834495505	56.40963105	0.160607377	44.35775192	45.47814866	47.37159889	51.10249055	56.40963105	63.65073939	73.04714239	80.96163098	87.61548453
219–219.99 months	−1.824479785	56.50095811	0.16076838	44.40972877	45.53431283	47.43464251	51.17822572	56.50095811	63.75740358	73.16079731	81.06743678	87.70342388
220–220.99 months	−1.813344222	56.59320107	0.160955249	44.45965358	45.58875384	47.49649958	51.25374544	56.59320107	63.86592525	73.27625982	81.17372627	87.78975439
221–221.99 months	−1.801153404	56.68632619	0.161166157	44.50763581	45.64156773	47.55724333	51.32907793	56.68632619	63.97619897	73.39338138	81.28039424	87.87449436
222–222.99 months	−1.787979408	56.78026364	0.161399151	44.5537724	45.69283549	47.61692775	51.40422448	56.78026364	64.08807505	73.51196857	81.38730069	87.95764367
223–223.99 months	−1.773901816	56.87490465	0.161652158	44.598146	45.74262109	47.6755854	51.47915686	56.87490465	64.20135697	73.63178167	81.49427023	88.03918325
224–224.99 months	−1.759007704	56.97009856	0.161922998	44.64082307	45.79096943	47.733225	51.55381463	56.97009856	64.31579883	73.75253327	81.60109165	88.11907438
225–225.99 months	−1.743391606	57.06564989	0.162209399	44.68185184	45.83790409	47.78982906	51.62810228	57.06564989	64.43110284	73.87388701	81.70751748	88.19725823
226–226.99 months	−1.72715546	57.16131528	0.162509006	44.72126019	45.88342504	47.84535121	51.70188628	57.16131528	64.54691678	73.99545642	81.8132637	88.27365525
227–227.99 months	−1.710410733	57.25679821	0.162819353	44.75905693	45.92750914	47.89971542	51.7749921	57.25679821	64.66282755	74.11679995	81.91800816	88.34816753
228–228.99 months	−1.693267093	57.35175792	0.163138124	44.79521204	45.97009344	47.9528045	51.84720202	57.35175792	64.77837954	74.23743894	82.02139464	88.42066003
229–229.99 months	−1.67585442	57.44578172	0.163462715	44.82968627	46.01109826	48.00447244	51.91824859	57.44578172	64.89303137	74.35682105	82.12302792	88.49100174
230–230.99 months	−1.658302847	57.53840429	0.163790683	44.86239882	46.05040055	48.05452712	51.98781418	57.53840429	65.00619161	74.47435424	82.22248225	88.55903385
231–231.99 months	−1.640747464	57.62910094	0.164119574	44.89323794	46.08784264	48.10273611	52.05553129	57.62910094	65.11720439	74.58938617	82.3192791	88.62454872
232–232.99 months	−1.623332891	57.7172758	0.164446997	44.92205384	46.12322421	48.14881709	52.12097097	57.7172758	65.22534243	74.70121281	82.41291688	88.68734305
233–233.99 months	−1.606209374	57.80226553	0.164770638	44.94865678	46.15630107	48.1924379	52.1836449	57.80226553	65.32980994	74.80907365	82.50285304	88.74718402
234–234.99 months	−1.589533346	57.88333502	0.165088289	44.97281279	46.18678082	48.23321202	52.24300075	57.88333502	65.42973979	74.91215216	82.58850833	88.80381758
235–235.99 months	−1.573467222	57.95967458	0.165397881	44.99423978	46.21431895	48.27069475	52.2984187	57.95967458	65.52419173	75.00957518	82.66926695	88.85696942
236–236.99 months	−1.558179166	58.0303973	0.165697507	45.01260329	46.23851477	48.3043794	52.34920805	58.0303973	65.61215061	75.10041216	82.74447678	88.90634626
237–237.99 months	−1.543846192	58.09453209	0.165985386	45.02751676	46.2589107	48.33369518	52.39460282	58.09453209	65.69251821	75.18366937	82.81344962	88.95164479
238–238.99 months	−1.530642461	58.15103575	0.166260109	45.03852094	46.27497563	48.35799667	52.4337619	58.15103575	65.76413346	75.25830602	82.87546122	88.99252982
239–239.99 months	−1.518754013	58.1987714	0.16652037	45.04509979	46.28611635	48.37656825	52.46576117	58.1987714	65.8257417	75.32321054	82.92975179	89.02866893

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years

Sex and age	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys												
24–24.99 months	1.00720807	86.86160934	0.040395626	80.26037074	81.08868489	82.36400989	84.49470553	86.86160934	89.22804829	91.35753004	92.63176749	93.45923029
25–25.99 months	0.837251351	87.65247282	0.040577525	81.0052937	81.83445202	83.11387064	85.25887745	87.65247282	90.05675457	92.22966054	93.53406648	94.38278047
26–26.99 months	0.681492975	88.42326434	0.040723122	81.7341574	82.56406112	83.84716151	86.0051731	88.42326434	90.8626041	93.07608163	94.40884914	95.27761711
27–27.99 months	0.538779654	89.17549228	0.040833194	82.44845648	83.27898582	84.56534433	86.73506945	89.17549228	91.64711353	93.89827114	95.25754106	96.14511823
28–28.99 months	0.407697153	89.91040853	0.040909059	83.14944982	83.98045262	85.26961974	87.44977223	89.91040853	92.41159029	94.69757027	96.08148848	96.98662531
29–29.99 months	0.286762453	90.62907762	0.040952433	83.83819399	84.66948449	85.96098331	88.15028421	90.62907762	93.15718995	95.47522083	96.88197981	97.8034532
30–30.99 months	0.174489485	91.33242379	0.04096533	84.51558277	85.3469433	86.64027154	88.83745411	91.33242379	93.88495599	96.23239427	97.66026663	98.59690538
31–31.99 months	0.069444521	92.02127167	0.040949976	85.18238019	86.01356554	87.30820085	89.5120186	92.02127167	94.59585394	96.97021533	98.4175791	99.36828331
32–32.99 months	−0.029720564	92.69637946	0.040908737	85.83925011	86.66999332	87.96540055	90.17463683	92.69637946	95.29079906	97.68978097	99.15513792	100.1188932
33–33.99 months	−0.124251789	93.35846546	0.040844062	86.48678276	87.31680155	88.61244073	90.82591867	93.35846546	95.97067824	98.39217521	99.87416352	100.8500508
34–34.99 months	−0.215288396	94.00822923	0.040758431	87.12551862	87.95452162	89.24985581	91.46644774	94.00822923	96.63636727	99.0784807	100.5758831	101.5630853
35–35.99 months	−0.30385434	94.64636981	0.040654312	87.75596799	88.58366128	89.87816458	92.09680119	94.64636981	97.28874542	99.74978771	101.2615351	102.2593402
36–36.99 months	−0.390918369	95.27359106	0.04053412	88.37863651	89.20472611	90.49788649	92.71755946	95.27359106	97.92869928	100.4071992	101.9323762	102.940182
37–37.99 months	−0.254801167	95.91474929	0.040572876	88.93297086	89.77301106	91.08607735	93.33440049	95.91474929	98.58524582	101.0690065	102.5930445	103.5982668
38–38.99 months	−0.125654535	96.54734328	0.04061691	89.47916294	90.33305814	91.66588835	93.94268367	96.54734328	99.23357783	101.7233762	103.2470198	104.2502776
39–39.99 months	−0.00316735	97.17191309	0.040666414	90.01765704	90.88532031	92.23778882	94.54291151	97.17191309	99.87425862	102.3708617	103.8948257	104.8967054
40–40.99 months	0.11291221	97.78897727	0.040721467	90.54890623	91.43025486	92.80224597	95.1355744	97.78897727	100.5078239	103.011988	104.5369608	105.5380208
41–41.99 months	0.222754969	98.3990283	0.040782045	91.07337426	91.96832362	93.35972283	95.72114636	98.3990283	101.1347788	103.6472524	105.1739016	106.1746779
42–42.99 months	0.326530126	99.00254338	0.040848042	91.59152368	92.4999858	93.91067749	96.30009195	99.00254338	101.7556073	104.2771267	105.8060983	106.8071048
43–43.99 months	0.42436156	99.599977	0.040919281	92.10382052	93.02569976	94.45556109	96.87286014	99.599977	102.370767	104.9020571	106.4339786	107.4357106
44–44.99 months	0.516353108	100.191764	0.040995524	92.6107295	93.54591978	94.99481672	97.43988586	100.191764	102.9806917	105.5224653	107.0579468	108.0608826
45–45.99 months	0.602595306	100.7783198	0.041076485	93.11271174	94.06109422	95.52887815	98.00158958	100.7783198	103.5857927	106.1387493	107.6783842	108.6829866
46–46.99 months	0.683170764	101.3600411	0.041161838	93.61022262	94.57166376	96.05816868	98.55837705	101.3600411	104.186459	106.7512837	108.2956497	109.3023669
47–47.99 months	0.758158406	101.9373058	0.041251224	94.10370972	95.07805975	96.58310008	99.11063889	101.9373058	104.7830584	107.3604207	108.9100797	109.9193463
48–48.99 months	0.827636736	102.5104735	0.041344257	94.59361093	95.58070273	97.1040715	99.65875031	102.5104735	105.3759377	107.9664906	109.5219891	110.5342263
49–49.99 months	0.891686306	103.0798852	0.041440534	95.08035263	96.08000091	97.62146857	100.2030707	103.0798852	105.9654232	108.569802	110.1316713	111.1472879
50–50.99 months	0.95039153	103.645864	0.041539635	95.56434805	96.57634888	98.13566246	100.7439435	103.645864	106.5518212	109.1706428	110.7393989	111.7587911
51–51.99 months	1.003830006	104.208713	0.041641136	96.04599748	97.07012724	98.64700876	101.281694	104.208713	107.1354171	109.76928	111.3454248	112.3689778
52–52.99 months	1.05213569	104.7687256	0.041744602	96.52567713	97.56169654	99.15584797	101.8166373	104.7687256	107.7164829	110.3659614	111.9499779	112.9780622
53–53.99 months	1.0953669	105.3261638	0.041849607	97.00375833	98.05140652	99.66250203	102.3490611	105.3261638	108.2952617	110.9609139	112.5532737	113.5862516
54–54.99 months	1.133652119	105.8812823	0.041955723	97.48058355	98.53958366	100.1672766	102.8792439	105.8812823	108.8719858	111.5543461	113.1555037	114.1937245
55–55.99 months	1.167104213	106.4343146	0.042062532	97.95647862	99.026537	100.6704587	103.4074438	106.4343146	109.4468665	112.1464475	113.7568423	114.800644
56–56.99 months	1.195845353	106.9854769	0.042169628	98.43174768	99.51255522	101.1723164	103.9339016	106.9854769	110.0200973	112.7373894	114.3574452	115.4071549
57–57.99 months	1.220004233	107.534968	0.042276619	98.90667254	99.99790605	101.6730987	104.4588401	107.534968	110.5918541	113.327325	114.9574502	116.0133837
58–58.99 months	1.239715856	108.0829695	0.042383129	99.3815118	100.4828356	102.1730346	104.9824642	108.0829695	111.1622955	113.9163901	115.5569776	116.6194398
59–59.99 months	1.255121285	108.6296457	0.042488804	99.85650001	100.9675675	102.6723326	105.5049607	108.6296457	111.731563	114.5047033	116.1561304	117.2254154
60–60.99 months	1.266367398	109.1751441	0.042593311	100.331847	101.4523027	103.171181	106.026498	109.1751441	112.2997816	115.0923665	116.7549954	117.831386
61–61.99 months	1.273606657	109.7195954	0.042696342	100.8077371	101.9372185	103.6697469	106.5472265	109.7195954	112.86706	115.6794655	117.3536426	118.4374113
62–62.99 months	1.276996893	110.2631136	0.042797615	101.2843288	102.4224687	104.1681762	107.0672782	110.2631136	113.4334909	116.2660704	117.9521268	119.0435349
63–63.99 months	1.276701119	110.8057967	0.042896877	101.7617545	102.908183	104.6665937	107.5867669	110.8057967	113.9991516	116.8522359	118.5504872	119.6497853
64–64.99 months	1.272887366	111.3477265	0.042993904	102.2401199	103.3944666	105.1651027	108.1057886	111.3477265	114.5641044	117.4380018	119.1487482	120.2561762
65–65.99 months	1.265728536	111.8889694	0.043088503	102.719504	103.8814006	105.6637849	108.6244211	111.8889694	115.128397	118.0233939	119.7469201	120.8627069
66–66.99 months	1.255402281	112.4295761	0.043180513	103.1999595	104.3690418	106.1627011	109.1427246	112.4295761	115.6920629	118.6084238	120.3449993	121.4693629
67–67.99 months	1.242090871	112.9695827	0.043269806	103.6815122	104.8574227	106.6618905	109.6607418	112.9695827	116.2551221	119.1930903	120.9429688	122.0761162
68–68.99 months	1.225981067	113.5090108	0.043356287	104.164162	105.3465519	107.1613717	110.1784984	113.5090108	116.8175812	119.777379	121.540799	122.682926
69–69.99 months	1.207263978	114.0478678	0.043439893	104.6478827	105.8364145	107.6611426	110.6960031	114.0478678	117.3794345	120.3612638	122.1384479	123.2897392
70–70.99 months	1.186140222	114.5861486	0.043520597	105.1326221	106.3269721	108.1611811	111.2132492	114.5861486	117.9406648	120.9447067	122.7358617	123.8964899
71–71.99 months	1.162796198	115.1238315	0.043598407	105.6183068	106.8181654	108.6614449	111.7302112	115.1238315	118.5012409	121.5276587	123.3329768	124.5031042
72–72.99 months	1.137442868	115.6608862	0.043673359	106.1048359	107.3099116	109.1618735	112.2468516	115.6608862	119.0611237	122.1100607	123.9297176	125.1094938

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
73–73.99 months	1.110286487	116.1972691	0.043745523	106.592087	107.8021076	109.6623876	112.7631168	116.1972691	119.6202624	122.6918435	124.5259991	125.7155618
74–74.99 months	1.081536236	116.732925	0.043815003	107.0799166	108.2946307	110.1628906	113.2789389	116.732925	120.1785968	123.272929	125.1217272	126.3212019
75–75.99 months	1.05140374	117.2677879	0.043881929	107.5681606	108.7873391	110.6632694	113.7942368	117.2677879	120.7360574	123.8532304	125.7167992	126.926299
76–76.99 months	1.020102497	117.8017819	0.043946461	108.0566359	109.2800738	111.1633949	114.3089166	117.8017819	121.2925663	124.4326533	126.3111047	127.5307299
77–77.99 months	0.987847213	118.3348215	0.044008785	108.5451423	109.7726591	111.6631239	114.8228726	118.3348215	121.8480376	125.0110959	126.9045258	128.134364
78–78.99 months	0.954853043	118.8668123	0.044069112	109.0334636	110.2649049	112.1622995	115.335988	118.8668123	122.4023786	125.5884499	127.4969382	128.737064
79–79.99 months	0.921334742	119.397652	0.044127675	109.5213695	110.7566073	112.6607528	115.8481358	119.397652	122.9554895	126.1646012	128.0882119	129.3386866
80–80.99 months	0.887505723	119.9272309	0.044184725	110.0086174	111.247551	113.158304	116.3591802	119.9272309	123.5072652	126.7394306	128.6782115	129.9390834
81–81.99 months	0.85357703	120.455433	0.044240532	110.4949545	111.7375104	113.654764	116.8689769	120.455433	124.057595	127.3128143	129.2667977	130.5381015
82–82.99 months	0.819756239	120.9821362	0.044295379	110.9801192	112.2262515	114.1499353	117.3773747	120.9821362	124.6063638	127.8846249	129.8538272	131.1355844
83–83.99 months	0.786246296	121.5072136	0.044349559	111.4638437	112.7135338	114.6436141	117.8842164	121.5072136	125.1534527	128.4547316	130.4391542	131.7313729
84–84.99 months	0.753244292	122.0305342	0.044403374	111.9458554	113.1991118	115.1355915	118.3893397	122.0305342	125.6987395	129.0230015	131.0226304	132.3253057
85–85.99 months	0.720940222	122.5519634	0.04445713	112.4258796	113.6827373	115.625655	118.8925788	122.5519634	126.2420996	129.5892999	131.6041067	132.9172205
86–86.99 months	0.689515708	123.0713645	0.044511135	112.9036412	114.1641607	116.1135904	119.3937653	123.0713645	126.7834065	130.153491	132.183433	133.5069548
87–87.99 months	0.659142731	123.588599	0.044565693	113.3788664	114.6431334	116.5991827	119.8927292	123.588599	127.3225327	130.7154389	132.7604599	134.0943467
88–88.99 months	0.629997853	124.1035312	0.044621104	113.8512827	115.1194078	117.0822191	120.3893032	124.1035312	127.8593529	131.2750083	133.335037	134.6792321
89–89.99 months	0.602203984	124.6160161	0.044677662	114.3206308	115.5927447	117.562488	120.8833137	124.6160161	128.393735	131.8320643	133.9070206	135.2614591
90–90.99 months	0.575908038	125.1259182	0.044735646	114.7866522	116.0629074	118.0397834	121.3745956	125.1259182	128.9255543	132.3864745	134.4762655	135.8408704
91–91.99 months	0.55123134	125.6331012	0.044795322	115.2491001	116.5296686	118.5139049	121.8629855	125.6331012	129.4546858	132.9381089	135.0426312	136.4173156
92–92.99 months	0.528279901	126.1374319	0.044856941	115.7077388	116.9928104	118.9846594	122.3483243	126.1374319	129.9810071	133.4868407	135.6059815	136.9906494
93–93.99 months	0.507143576	126.6387804	0.04492073	116.1623461	117.4521263	119.4518627	122.8304588	126.6387804	130.504399	134.0325473	136.1661852	137.5607324
94–94.99 months	0.487895344	127.1370217	0.044986899	116.6127146	117.9074226	119.9153408	123.3092425	127.1370217	131.024746	134.5751108	136.7231173	138.1274323
95–95.99 months	0.470590753	127.6320362	0.045055632	117.0586529	118.3585201	120.3749315	123.784537	127.6320362	131.5419375	135.1144188	137.2766592	138.6906245
96–96.99 months	0.455267507	128.1237104	0.045127088	117.4999879	118.8052553	120.830485	124.2562127	128.1237104	132.0558684	135.6503652	137.8267001	139.2501934
97–97.99 months	0.441945241	128.6119383	0.045201399	117.9365657	119.2474816	121.281866	124.7241502	128.6119383	132.5664397	136.1828511	138.3731376	139.8060325
98–98.99 months	0.430625458	129.096622	0.045278671	118.3682526	119.6850711	121.7289543	125.1882412	129.096622	133.0735595	136.7117853	138.9158785	140.3580462
99–99.99 months	0.421291648	129.5776723	0.045358979	118.794937	120.1179149	122.1716458	125.6483893	129.5776723	133.5771438	137.2370854	139.4548395	140.9061502
100–100.99 months	0.413909588	130.0550101	0.045442372	119.2165297	120.5459248	122.6098539	126.1045113	130.0550101	134.0771172	137.7586784	139.9899485	141.4502723
101–101.99 months	0.408427813	130.5285669	0.045528869	119.6329654	120.9690339	123.04351	126.5565377	130.5285669	134.5734138	138.2765017	140.5211451	141.9903534
102–102.99 months	0.404778262	130.9982857	0.045618459	120.0442031	121.3871973	123.4725646	127.0044134	130.9982857	135.065978	138.7905039	141.0483813	142.5263486
103–103.99 months	0.402877077	131.4641218	0.045711105	120.450227	121.8003934	123.896988	127.4480994	131.4641218	135.5547656	139.3006456	141.5716229	143.0582274
104–104.99 months	0.402625561	131.9260439	0.045806742	120.8510473	122.2086239	124.3167709	127.8875724	131.9260439	136.0397444	139.8069003	142.0908498	143.5859753
105–105.99 months	0.40391127	132.3840348	0.045905281	121.2467001	122.6119145	124.7319249	128.3228265	132.3840348	136.5208952	140.3092555	142.6060571	144.109594
106–106.99 months	0.406609232	132.838092	0.046006604	121.6372483	123.0103156	125.1424835	128.7538732	132.838092	136.9982129	140.8077133	143.1172562	144.6291028
107–107.99 months	0.410583274	133.2882291	0.046110573	122.0227817	123.4039024	125.5485022	129.1807426	133.2882291	137.4717069	141.3022916	143.6244753	145.1445387
108–108.99 months	0.415687443	133.7344759	0.046217028	122.4034171	123.7927752	125.9500588	129.6034839	133.7344759	137.9414029	141.793025	144.1277605	145.6559581
109–109.99 months	0.421767514	134.1768801	0.04632579	122.7792983	124.1770596	126.3472542	130.0221657	134.1768801	138.4073433	142.2799654	144.6271767	146.1634368
110–110.99 months	0.428662551	134.6155076	0.046436662	123.1505962	124.5569064	126.7402123	130.436877	134.6155076	138.8695881	142.7631838	145.1228083	146.6670713
111–111.99 months	0.436206531	135.0504433	0.04654943	123.5175084	124.9324922	127.1290805	130.8477278	135.0504433	139.3282163	143.2427702	145.6147602	147.1669794
112–112.99 months	0.44423	135.4817925	0.046663871	123.8802592	125.3040185	127.5140299	131.2548494	135.4817925	139.7833266	143.7188356	146.103159	147.6633011
113–113.99 months	0.45256176	135.9096813	0.046779748	124.2390993	125.6717122	127.8952551	131.6583952	135.9096813	140.2350389	144.1915122	146.5881531	148.1561991
114–114.99 months	0.461030578	136.3342577	0.046896817	124.5943049	126.035825	128.2729746	132.0585409	136.3342577	140.6834944	144.6609548	147.0699143	148.6458598
115–115.99 months	0.469466904	136.7556923	0.047014827	124.9461775	126.3966334	128.6474311	132.4554857	136.7556923	141.1288576	145.1273417	147.5486382	149.132494
116–116.99 months	0.477704608	137.1741794	0.047133525	125.2950434	126.7544381	129.0188908	132.8494521	137.1741794	141.5713168	145.5908755	148.0245452	149.6163372
117–117.99 months	0.48558272	137.5899378	0.047252654	125.6412524	127.1095636	129.3876441	133.2406866	137.5899378	142.011085	146.0517839	148.4978811	150.0976507
118–118.99 months	0.492947182	138.0032114	0.047371961	125.9851773	127.4623576	129.7540048	133.6294604	138.0032114	142.4484014	146.510321	148.9689178	150.5767217
119–119.99 months	0.499652617	138.4142703	0.047491194	126.3272131	127.8131904	130.1183106	134.0160697	138.4142703	142.8835317	146.9667676	149.4379538	151.0538639
120–120.99 months	0.505564115	138.8234114	0.047610108	126.6677753	128.1624542	130.4809221	134.4008357	138.8234114	143.3167691	147.421432	149.9053151	151.5294179
121–121.99 months	0.510559047	139.2309592	0.047728463	127.0072991	128.5105623	130.8422234	134.7841054	139.2309592	143.7484354	147.8746507	150.3713549	152.0037511

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
122–122.99 months	0.514528903	139.6372663	0.04784603	127.3462381	128.857948	131.2026207	135.1662516	139.6372663	144.1788815	148.326789	150.8364543	152.4772579
123–123.99 months	0.517381177	140.042714	0.047962592	127.6850624	129.2050634	131.5625423	135.5476732	140.042714	144.6084877	148.7782409	151.3010223	152.9503596
124–124.99 months	0.519041285	140.4477127	0.048077942	128.0242572	129.5523785	131.9224379	135.9287948	140.4477127	145.0376645	149.2294296	151.7654951	153.4235035
125–125.99 months	0.519454524	140.8527022	0.048191889	128.3643208	129.9003795	132.2827776	136.3100669	140.8527022	145.4668527	149.6808068	152.2303363	153.8971624
126–126.99 months	0.518588072	141.2581515	0.048304259	128.7057627	130.2495672	132.6440511	136.6919657	141.2581515	145.8965233	150.1328531	152.6960355	154.3718335
127–127.99 months	0.516433004	141.6645592	0.048414893	129.0491015	130.6004555	133.0067661	137.0749922	141.6645592	146.3271773	150.5860767	153.1631074	154.8480367
128–128.99 months	0.513006312	142.072452	0.048523648	129.394862	130.9535693	133.3714475	137.4596717	142.072452	146.7593449	151.0410123	153.6320904	155.3263129
129–129.99 months	0.508352901	142.4823852	0.048630402	129.7435732	131.309442	133.738635	137.8465525	142.4823852	147.1935849	151.4982199	154.103544	155.8072211
130–130.99 months	0.502547502	142.8949403	0.04873505	130.095765	131.6686134	134.1088817	138.2362048	142.8949403	147.630483	151.9582822	154.5780465	156.2913356
131–131.99 months	0.495696454	143.3107241	0.048837504	130.4519655	132.031627	134.4827517	138.6292185	143.3107241	148.07065	152.4218027	155.0561919	156.7792423
132–132.99 months	0.487939275	143.7303663	0.048937694	130.8126976	132.3990267	134.8608171	139.0262015	143.7303663	148.5147188	152.8894016	155.5385858	157.2715342
133–133.99 months	0.479449924	144.1545167	0.049035564	131.1784756	132.771354	135.2436555	139.4277761	144.1545167	148.9633421	153.3617127	156.0258407	157.7688063
134–134.99 months	0.470437652	144.5838414	0.049131073	131.5498015	133.1491442	135.6318463	139.8345767	144.5838414	149.4171874	153.839378	156.5185711	158.27165
135–135.99 months	0.461147305	145.0190192	0.049224189	131.9271616	133.5329226	136.0259671	140.2472448	145.0190192	149.876933	154.3230425	157.0173867	158.7806462
136–136.99 months	0.451858946	145.4607359	0.049314887	132.311022	133.9232006	136.4265892	140.6664253	145.4607359	150.3432618	154.8133474	157.522886	159.2963578
137–137.99 months	0.442886661	145.9096784	0.049403145	132.7018251	134.3204714	136.8342729	141.0927603	145.9096784	150.8168546	155.3109233	158.0356481	159.8193221
138–138.99 months	0.434576385	146.3665278	0.049488934	133.0999854	134.7252055	137.2495627	141.5268837	146.3665278	151.2983826	155.8163811	158.5562242	160.3500415
139–139.99 months	0.427302633	146.8319513	0.049572216	133.5058853	135.1378458	137.6729811	141.9694138	146.8319513	151.7884983	156.3303034	159.085128	160.8889743
140–140.99 months	0.421464027	147.3065929	0.049652935	133.9198714	135.5588028	138.1050231	142.4209457	147.3065929	152.2878255	156.8532337	159.622826	161.4365245
141–141.99 months	0.417477538	147.7910635	0.049731004	134.34225	135.9884501	138.5461496	142.8820429	147.7910635	152.7969484	157.3856659	160.1697263	161.993032
142–142.99 months	0.415771438	148.2859294	0.0498063	134.773284	136.4271185	138.9967803	143.353228	148.2859294	153.3163996	157.9280318	160.7261679	162.5587616
143–143.99 months	0.416777012	148.7917006	0.04987865	135.2131887	136.8750919	139.4572873	143.8349727	148.7917006	153.8466466	158.4806894	161.2924091	163.133893
144–144.99 months	0.420919142	149.3088178	0.049947823	135.6621289	137.3326017	139.9279871	144.3276874	149.3088178	154.3880792	159.0439098	161.8686162	163.7185106
145–145.99 months	0.428606007	149.8376391	0.050013518	136.1202156	137.7998222	140.409134	144.8317108	149.8376391	154.9409947	159.6178646	162.4548526	164.3125939
146–146.99 months	0.440218167	150.3784267	0.050075353	136.5875035	138.2768661	140.9009122	145.3472981	150.3784267	155.505584	160.2026132	163.0510679	164.9160089
147–147.99 months	0.456097443	150.9313331	0.050132858	137.0639883	138.7637799	141.403429	145.8746111	150.9313331	156.0819181	160.7980913	163.657089	165.5285004
148–148.99 months	0.476536014	151.4963887	0.050185471	137.5496052	139.2605402	141.9167079	146.4137069	151.4963887	156.6699351	161.4041	164.2726114	166.1496863
149–149.99 months	0.501766234	152.0734897	0.050232532	138.0442266	139.7670498	142.4406823	146.9645285	152.0734897	157.2694285	162.0202967	164.897193	166.7790531
150–150.99 months	0.531951655	152.6623878	0.050273285	138.5476617	140.2831346	142.9751899	147.5268957	152.6623878	157.8800378	162.6461885	165.5302497	167.4159536
151–151.99 months	0.567179725	153.2626819	0.050306885	139.0596548	140.8085414	143.5199675	148.1004983	153.2626819	158.5012409	163.2811271	166.1710534	168.0596069
152–152.99 months	0.607456565	153.8738124	0.050332406	139.5798855	141.3429356	144.0746481	148.6848902	153.8738124	159.1323501	163.9243081	166.8187329	168.7091009
153–153.99 months	0.652704121	154.495058	0.05034886	140.1079685	141.8859002	144.6387576	149.2794857	154.495058	159.7725112	164.5747721	167.4722776	169.3633976
154–154.99 months	0.702759868	155.1255365	0.050355216	140.6434536	142.4369354	145.2117144	149.8835591	155.1255365	160.4207062	165.2314109	168.1305444	170.0213408
155–155.99 months	0.757379106	155.7642086	0.050350423	141.1858268	142.9954591	145.7928297	150.4962462	155.7642086	161.0757603	165.892976	168.7922681	170.6816665
156–156.99 months	0.816239713	156.4098858	0.050333444	141.7345116	143.5608087	146.3813098	151.1165487	156.4098858	161.7363527	166.5580917	169.4560742	171.3430163
157–157.99 months	0.878947416	157.0612415	0.050303283	142.2888712	144.1322433	146.9762604	151.7433416	157.0612415	162.4010311	167.2252714	170.1204959	172.0039535
158–158.99 months	0.945053486	157.7168289	0.050259018	142.8482077	144.7089466	147.576693	152.3753859	157.7168289	163.0682321	167.8929368	170.7839909	172.662978
159–159.99 months	1.014046108	158.3750929	0.050199837	143.4117718	145.2900346	148.1815319	153.0113368	158.3750929	163.7362982	168.5594402	171.444966	173.3185527
160–160.99 months	1.085383319	159.034399	0.050125062	143.9787585	145.8745579	148.7896253	153.6497654	159.034399	164.4035075	169.2230883	172.1017957	173.9691164
161–161.99 months	1.158487278	159.6930501	0.05003418	144.5483179	146.4615117	149.3997554	154.2891719	159.6930501	165.0680948	169.8821678	172.7528491	174.6131123
162–162.99 months	1.232768816	160.3493168	0.049926861	145.1195552	147.0498421	150.0106525	154.9280091	160.3493168	165.7282823	170.5349712	173.3965112	175.2490052
163–163.99 months	1.307628899	161.0014586	0.049802977	145.6915401	147.6384567	150.6210083	155.5647003	161.0014586	166.3823042	171.1798224	174.0312083	175.8753066
164–164.99 months	1.382473225	161.6477515	0.04966261	146.2633119	148.226234	151.2294913	156.1976616	161.6477515	167.0284338	171.8151013	174.6554295	176.490594
165–165.99 months	1.456720479	162.2865119	0.049506051	146.8338868	148.8120346	151.8347622	156.8253238	162.2865119	167.6650085	172.4392666	175.2677481	177.0935299
166–166.99 months	1.529810247	162.9161202	0.049333801	147.4022657	149.394712	152.4354895	157.4461523	162.9161202	168.2904522	173.0508762	175.8668393	177.6828795
167–167.99 months	1.601219573	163.535045	0.049146553	147.9674393	149.9731226	153.0303654	158.0586697	163.535045	168.9032981	173.6486051	176.4514947	178.2575211
168–168.99 months	1.670433444	164.1418486	0.04894519	148.5284089	150.5461431	153.6181187	158.6614636	164.1418486	169.5021963	174.2312589	177.0206409	178.8164693
169–169.99 months	1.736995571	164.7352199	0.048730749	149.0841789	151.1126739	154.1975312	159.2532157	164.7352199	170.0859388	174.7977852	177.5733406	179.3588685
170–170.99 months	1.800483802	165.3139755	0.048504404	149.6337753	151.6716544	154.7674484	159.8327068	165.3139755	170.6534628	175.347281	178.1088034	179.8840066

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
171–171.99 months	1.860518777	165.8770715	0.048267442	150.1762526	152.2220718	155.3267913	160.3988301	165.8770715	171.2038574	175.8789961	178.6263873	180.3913154
172–172.99 months	1.916765525	166.4236087	0.04802123	150.7107013	152.7629701	155.874565	160.9505985	166.4236087	171.7363673	176.392334	179.1255987	180.8803698
173–173.99 months	1.968934444	166.9528354	0.047767192	151.2362566	153.2934582	156.4098665	161.4871507	166.9528354	172.2503918	176.8868489	179.6060885	181.3508837
174–174.99 months	2.016781776	167.4641466	0.047506783	151.7521046	153.8127163	156.9318906	162.0077536	167.4641466	172.7454817	177.3622413	180.0676464	181.8027041
175–175.99 months	2.060109658	167.9570814	0.047241456	152.2574887	154.3200013	157.4399327	162.5118031	167.9570814	173.2213335	177.8183499	180.5101936	182.2358034
176–176.99 months	2.098765817	168.4313175	0.04697265	152.7517151	154.814651	157.9333914	162.9988222	168.4313175	173.6777819	178.2551431	180.9337725	182.6502694
177–177.99 months	2.132642948	168.8866644	0.046701759	153.2341567	155.2960861	158.4117685	163.4684575	168.8866644	174.1147899	178.6727081	181.3385364	183.0462946
178–178.99 months	2.16167779	169.3230548	0.046430122	153.7042563	155.7638123	158.8746672	163.9204738	169.3230548	174.5324388	179.0712394	181.7247376	183.4241646
179–179.99 months	2.185849904	169.7405351	0.046159004	154.1615288	156.2174196	159.3217901	164.3547479	169.7405351	174.9309165	179.4510272	182.0927156	183.7842466
180–180.99 months	2.205180153	170.139255	0.045889585	154.6055622	156.6565818	159.7529343	164.7712603	170.139255	175.310506	179.8124447	182.4428851	184.1269767
181–181.99 months	2.219728869	170.5194567	0.045622955	155.0360175	157.0810539	160.1679874	165.1700873	170.5194567	175.6715733	180.1559363	182.7757235	184.4528488
182–182.99 months	2.2295937	170.881464	0.045360101	155.452628	157.4906696	160.5669211	165.5513919	170.881464	176.0145556	180.4820061	183.09176	184.7624031
183–183.99 months	2.234907144	171.2256717	0.045101913	155.8551976	157.8853369	160.9497852	165.9154147	171.2256717	176.3399504	180.791206	183.3915648	185.0562159
184–184.99 months	2.235833767	171.5525345	0.044849174	156.243598	158.2650343	161.3167006	166.2624644	171.5525345	176.648304	181.0841263	183.6757386	185.3348893
185–185.99 months	2.232567138	171.8625576	0.044602566	156.6177662	158.6298055	161.6678528	166.5929092	171.8625576	176.9402021	181.3613851	183.9449038	185.5990431
186–186.99 months	2.2253265	172.1562865	0.044362674	156.9777005	158.9797544	162.0034846	166.9071674	172.1562865	177.2162598	181.6236202	184.1996965	185.8493063
187–187.99 months	2.214353232	172.4342983	0.044129985	157.3234565	159.31504	162.3238889	167.2056993	172.4342983	177.4771134	181.871481	184.4407585	186.0863109
188–188.99 months	2.199905902	172.6971935	0.043904897	157.6551432	159.6358703	162.6294022	167.4889986	172.6971935	177.7234122	182.1056218	184.6687321	186.3106859
189–189.99 months	2.182262864	172.9455898	0.043687723	157.9729166	159.9424968	162.9203983	167.7575872	172.9455898	177.9558135	182.3266957	184.8842531	186.5230505
190–190.99 months	2.161704969	173.180112	0.043478698	158.2769793	160.2352102	163.1972811	168.012004	173.180112	178.174973	182.5353493	185.0879485	186.7240141
191–191.99 months	2.138524662	173.4013896	0.043277987	158.5675712	160.5143338	163.4604795	168.2528029	173.4013896	178.381543	182.7322187	185.2804307	186.914169
192–192.99 months	2.113023423	173.6100518	0.043085685	158.8449655	160.7802183	163.7104424	168.4805469	173.6100518	178.5761676	182.9179257	185.4622948	187.0940877
193–193.99 months	2.085490286	173.8067179	0.042901835	159.1094689	161.0332391	163.9476322	168.6957988	173.8067179	178.7594756	183.093075	185.6341183	187.2643258
194–194.99 months	2.0562195	173.9919998	0.042726424	159.3614112	161.2737894	164.1725219	168.8991222	173.9919998	178.9320817	183.2582518	185.7964565	187.4254148
195–195.99 months	2.025496648	174.1664951	0.042559396	159.6011441	161.5022772	164.3855897	169.0910747	174.1664951	179.0945815	183.4140202	185.949843	187.5778643
196–196.99 months	1.993598182	174.3307855	0.042400652	159.8290369	161.7191211	164.5873165	169.2722058	174.3307855	179.2475503	183.5609217	186.0947883	187.7221607
197–197.99 months	1.960789092	174.4854344	0.042250063	160.0454725	161.9247473	164.7781818	169.4430536	174.4854344	179.3915415	183.6994748	186.2317794	187.8587671
198–198.99 months	1.927320937	174.6309856	0.042107465	160.2508441	162.1195857	164.9586613	169.6041427	174.6309856	179.5270853	183.8301738	186.3612801	187.9881233
199–199.99 months	1.89343024	174.7679617	0.041972676	160.4455519	162.3040676	165.1292244	169.7559826	174.7679617	179.6546885	183.9534894	186.4837302	188.1106465
200–200.99 months	1.859337259	174.8968634	0.041845488	160.6300005	162.4786229	165.2903324	169.8990665	174.8968634	179.7748338	184.0698683	186.5995468	188.2267311
201–201.99 months	1.825245107	175.0181691	0.041725679	160.8045956	162.643678	165.4424364	170.0338694	175.0181691	179.8879797	184.1797333	186.7091242	188.3367503
202–202.99 months	1.791339209	175.1323345	0.041613015	160.9697424	162.7996536	165.5859761	170.1608483	175.1323345	179.9945609	184.2834844	186.8128348	188.4410559
203–203.99 months	1.757787065	175.2397926	0.041507249	161.1258433	162.9469636	165.7213786	170.280441	175.2397926	180.0949883	184.3814989	186.9110296	188.5399798
204–204.99 months	1.724738292	175.340954	0.041408129	161.2732955	163.0860132	165.8490577	170.3930664	175.340954	180.1896498	184.4741322	187.0040394	188.6338345
205–205.99 months	1.692324905	175.4362071	0.041315398	161.4124903	163.2171976	165.9694129	170.4991239	175.4362071	180.278911	184.5617185	187.0921753	188.7229142
206–206.99 months	1.660661815	175.5259191	0.041228796	161.5438112	163.3409016	166.0828291	170.5989941	175.5259191	180.3631154	184.644572	187.1757295	188.8074955
207–207.99 months	1.629847495	175.6104358	0.04114806	161.6676329	163.4574984	166.1896765	170.6930385	175.6104358	180.4425858	184.7229873	187.2549767	188.8878386
208–208.99 months	1.599964788	175.690083	0.041072931	161.7843202	163.5673489	166.29031	170.7816002	175.690083	180.5176249	184.7972407	187.3301745	188.9641878
209–209.99 months	1.571081817	175.7651671	0.04100315	161.8942273	163.6708019	166.3850695	170.8650043	175.7651671	180.5885165	184.867591	187.4015645	189.0367727
210–210.99 months	1.543252982	175.8359757	0.040938463	161.9976976	163.7681929	166.4742799	170.9435584	175.8359757	180.6555257	184.9342803	187.4693732	189.1058089
211–211.99 months	1.516519998	175.9027788	0.040878617	162.0950624	163.8598446	166.5582511	171.0175531	175.9027788	180.7189006	184.9975349	187.5338128	189.1714988
212–212.99 months	1.490912963	175.9658293	0.040823368	162.1866414	163.9460665	166.6372787	171.0872629	175.9658293	180.7788732	185.0575666	187.5950821	189.2340323
213–213.99 months	1.466451429	176.0253641	0.040772475	162.272742	164.027155	166.7116437	171.1529465	176.0253641	180.8356596	185.114573	187.6533672	189.2935878
214–214.99 months	1.44314546	176.081605	0.040725706	162.3536592	164.1033935	166.7816133	171.2148477	176.081605	180.8894616	185.1687386	187.7088422	189.3503326
215–215.99 months	1.420996665	176.1347593	0.040682834	162.429676	164.1750527	166.8474411	171.2731962	176.1347593	180.9404676	185.2202359	187.7616702	189.4044237
216–216.99 months	1.399999187	176.1850208	0.04064364	162.501063	164.2423904	166.9093676	171.3282079	176.1850208	180.9888527	185.2692255	187.8120038	189.4560086
217–217.99 months	1.380140651	176.2325707	0.040607913	162.5680787	164.3056523	166.9676208	171.3800858	176.2325707	181.0347806	185.3158575	187.8599859	189.5052256
218–218.99 months	1.361403047	176.2775781	0.040575448	162.6309697	164.365072	167.0224162	171.4290208	176.2775781	181.0784033	185.3602719	187.9057499	189.5522044
219–219.99 months	1.343763564	176.3202008	0.040546051	162.689971	164.4208714	167.0739579	171.4751921	176.3202008	181.1198626	185.4025992	187.9494211	189.5970671

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile 3rd	5th	10th	25th	50th	75th	90th	95th	97th
Boys—Con.												
220–220.99 months	1.327195355	176.3605864	0.040519532	162.7453061	164.473261	167.1224387	171.5187679	176.3605864	181.1592906	185.4429613	187.9911165	189.6399279
221–221.99 months	1.311668242	176.3988725	0.040495713	162.7971876	164.5224406	167.1680405	171.5599062	176.3988725	181.1968103	185.4814718	188.0309455	189.6808943
222–222.99 months	1.297149359	176.4351874	0.040474421	162.8458172	164.5685992	167.2109353	171.598755	176.4351874	181.232536	185.5182368	188.0690108	189.7200672
223–223.99 months	1.283603728	176.469651	0.040455493	162.8913862	164.6119158	167.251285	171.6354533	176.469651	181.2665744	185.5533551	188.1054085	189.7575413
224–224.99 months	1.270994782	176.5023751	0.040438773	162.9340759	164.6525596	167.2892424	171.6701314	176.5023751	181.2990249	185.5869193	188.1402284	189.7934056
225–225.99 months	1.25928483	176.533464	0.040424111	162.9740581	164.6906907	167.3249515	171.7029114	176.533464	181.3299799	185.6190155	188.1735549	189.8277438
226–226.99 months	1.248435461	176.5630153	0.040411366	163.0114951	164.72646	167.3585477	171.7339076	176.5630153	181.3595256	185.6497244	188.2054669	189.8606344
227–227.99 months	1.23840791	176.5911197	0.040400405	163.0465405	164.7600102	167.3901586	171.7632274	176.5911197	181.3877426	185.6791212	188.2360386	189.8921514
228–228.99 months	1.229163362	176.6178621	0.040391101	163.0793392	164.7914756	167.4199044	171.7909712	176.6178621	181.4147056	185.7072763	188.2653392	189.9223642
229–229.99 months	1.220663228	176.6433219	0.040383334	163.1100283	164.8209832	167.4478978	171.8172333	176.6433219	181.4404846	185.7342556	188.293434	189.9513383
230–230.99 months	1.212869374	176.6675729	0.04037699	163.1387368	164.8486523	167.4742452	171.8421019	176.6675729	181.4651449	185.7601205	188.3203841	189.9791351
231–231.99 months	1.20574431	176.6906844	0.040371962	163.1655866	164.8745955	167.4990462	171.8656596	176.6906844	181.4887473	185.7849287	188.3462469	190.0058126
232–232.99 months	1.199251356	176.712721	0.040368149	163.1906925	164.8989187	167.5223947	171.8879838	176.712721	181.5113488	185.8087343	188.3710763	190.0314253
233–233.99 months	1.19335477	176.733743	0.040365456	163.2141625	164.9217215	167.5443789	171.9091473	176.733743	181.5330026	185.8315877	188.394923	190.0560245
234–234.99 months	1.188019859	176.753807	0.040363795	163.2360985	164.9430978	167.5650814	171.9292179	176.753807	181.5537583	185.8535364	188.4178347	190.0796588
235–235.99 months	1.183213059	176.7729657	0.04036308	163.2565964	164.9631357	167.5845802	171.9482593	176.7729657	181.5736625	185.874625	188.4398562	190.1023738
236–236.99 months	1.178901998	176.7912687	0.040363233	163.2757461	164.9819181	167.602948	171.9663314	176.7912687	181.5927588	185.8948951	188.4610297	190.1242124
237–237.99 months	1.175055543	176.8087622	0.040364179	163.2936325	164.9995229	167.6202536	171.9834901	176.8087622	181.6110879	185.914386	188.481395	190.1452154
238–238.99 months	1.171643828	176.8254895	0.04036585	163.3103353	165.0160233	167.6365611	171.9997878	176.8254895	181.6286882	185.9331347	188.5009894	190.1654212
239–239.99 months	1.16863827	176.8414914	0.04036818	163.3259293	165.031488	167.6519311	172.0152737	176.8414914	181.6455954	185.9511757	188.5198484	190.1848658
Girls												
24–24.99 months	1.051272912	85.3973169	0.040859727	78.82133263	79.64776859	80.91946302	83.04213246	85.3973169	87.74917522	89.86315834	91.12706971	91.94741225
25–25.99 months	1.041951175	86.29026318	0.041142161	79.60197647	80.44225735	81.73540957	83.89430336	86.29026318	88.683435	90.83504785	92.12167631	92.95684975
26–26.99 months	1.012592236	87.15714182	0.041349399	80.37554759	81.22666181	82.5369944	84.72592034	87.15714182	89.5875095	91.77420584	93.08254082	93.9320912
27–27.99 months	0.970541909	87.9960184	0.041500428	81.1356973	81.99539596	83.31968453	85.53389245	87.9960184	90.46017565	92.67968776	94.00872819	94.87214661
28–28.99 months	0.921129988	88.8055115	0.041610508	81.87746051	82.74410888	84.07997909	86.31588888	88.8055115	91.30065173	93.55096822	94.89974364	95.77649339
29–29.99 months	0.868221392	89.58476689	0.041691761	82.59711819	83.46956585	84.81531679	87.07028387	89.58476689	92.10858598	94.38792816	95.75551171	96.64504712
30–30.99 months	0.81454413	90.33341722	0.04175368	83.29206184	84.16952943	85.52398013	87.7960919	90.33341722	92.88403041	95.19083262	96.57635253	97.47813528
31–31.99 months	0.761957977	91.0515436	0.041803562	83.96065415	84.84263937	86.20500071	88.49290603	91.0515436	93.62741325	95.96030359	97.36295103	98.27646264
32–32.99 months	0.711660228	91.7396352	0.041846882	84.60209562	85.48829708	86.85806752	89.16083624	91.7396352	94.33950841	96.69728978	98.11632342	99.04107435
33–33.99 months	0.664323379	92.39854429	0.041887626	85.21630353	86.10655881	87.48343922	89.80044644	92.39854429	95.02140026	97.40303421	98.83778417	99.77332166
34–34.99 months	0.620285102	93.02945392	0.041928568	85.80378996	86.69803144	88.08186325	90.41270297	93.02945392	95.67445723	98.07904266	99.52890698	100.4748164
35–35.99 months	0.57955631	93.63382278	0.041971514	86.36557262	87.26378819	88.6544988	90.99890839	93.63382278	96.30028751	98.72704954	100.191497	101.1474075
36–36.99 months	0.54198094	94.21335709	0.042017509	86.90307328	87.80528157	89.20284893	91.56065781	94.21335709	96.9007148	99.34898744	100.8275527	101.7931359
37–37.99 months	0.511429832	94.79643239	0.042104522	87.43482018	88.34236213	89.74875322	92.12298263	94.79643239	97.50723533	99.97896123	101.4726459	102.448488
38–38.99 months	0.482799937	95.37391918	0.042199507	87.95945137	88.87255864	90.28810699	92.67925322	95.37391918	98.10854769	100.6040005	102.112939	103.0991159
39–39.99 months	0.455521041	95.94692677	0.042300333	88.47849954	89.39733426	90.82227549	93.23069622	95.94692677	98.70568284	101.2250993	102.7494191	103.7460086
40–40.99 months	0.429150288	96.51644912	0.042405225	88.99330218	89.91797078	91.35246174	93.77840211	96.51644912	99.2995686	101.8431523	103.3829734	104.3900531
41–41.99 months	0.403351725	97.08337211	0.042512706	89.50502066	90.43558554	91.87972051	94.3233355	97.08337211	99.89103539	102.4589604	104.0143944	105.0320405
42–42.99 months	0.377878239	97.6484807	0.042621565	90.01465759	90.95114701	92.40497144	94.86634477	97.6484807	100.4808219	103.0732359	104.6443859	105.6726719
43–43.99 months	0.352555862	98.21246579	0.042730809	90.52307278	91.4654891	92.92901112	95.40817129	98.21246579	101.0695807	103.6866076	105.2735676	106.3125633
44–44.99 months	0.327270297	98.77593069	0.042839638	91.03099757	91.97932415	93.45252422	95.94945793	98.77593069	101.6578832	104.2996257	105.9024803	106.9522508
45–45.99 months	0.301955463	99.33939735	0.042947412	91.5390479	92.49325483	93.97609374	96.49075704	99.33939735	102.2462253	104.9127666	106.5315907	107.5921959
46–46.99 months	0.276583851	99.9033122	0.043053626	92.04773605	93.00778484	94.50021028	97.03253788	99.9033122	102.8350319	105.5264371	107.161296	108.2327896
47–47.99 months	0.251158446	100.4680516	0.043157889	92.55748123	93.52332863	95.02528063	97.57519341	100.4680516	103.4246616	106.1409795	107.7919282	108.8743573
48–48.99 months	0.225705996	101.033927	0.043259907	93.06861913	94.04022021	95.55163545	98.11904662	101.033927	104.0154114	106.7566748	108.4237579	109.5171624
49–49.99 months	0.20027145	101.6011898	0.043359463	93.58141046	94.55872109	96.07953634	98.66435637	101.6011898	104.6075204	107.3737475	109.0569988	110.1614111
50–50.99 months	0.174913356	102.1700358	0.043456406	94.09604867	95.07902737	96.60918226	99.2113227	102.1700358	105.2011743	107.9923687	109.6918111	110.8072554

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age				Percentile								
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
51–51.99 months	0.149700081	102.7406094	0.043550638	94.61266684	95.60127628	97.14071535	99.76009185	102.7406094	105.7965086	108.6126601	110.3283052	111.4547971
52–52.99 months	0.12470671	103.3130077	0.043642107	95.13134395	96.12555202	97.67422621	100.3107608	103.3130077	106.3936129	109.2346972	110.9665451	112.1040915
53–53.99 months	0.100012514	103.8872839	0.043730791	95.65211042	96.65189097	98.20975881	100.8633813	103.8872839	106.9925336	109.8585126	111.6065515	112.7551501
54–54.99 months	0.075698881	104.4634511	0.043816701	96.17495324	97.18028656	98.74731484	101.4179641	104.4634511	107.5932772	110.4840992	112.2483051	113.4079442
55–55.99 months	0.051847635	105.0414853	0.043899867	96.69982047	97.7106936	99.28685775	101.9744822	105.0414853	108.1958137	111.1114131	112.8917498	114.0624076
56–56.99 months	0.02853967	105.6213287	0.043980337	97.2266254	98.24303219	99.82831652	102.5328747	105.6213287	108.8000793	111.7403765	113.536795	114.7184401
57–57.99 months	0.005853853	106.2028921	0.044058171	97.75525036	98.77719141	100.371589	103.0930492	106.2028921	109.405979	112.3708801	114.1833188	115.3759096
58–58.99 months	−0.016133871	106.7860583	0.04413344	98.28555005	99.31303257	100.9165451	103.6548853	106.7860583	110.0133894	113.0027865	114.8311708	116.0346553
59–59.99 months	−0.037351181	107.3706841	0.044206218	98.81735475	99.85039229	101.4630296	104.2182371	107.3706841	110.6221611	113.6359317	115.4801741	116.6944901
60–60.99 months	−0.057729947	107.9566031	0.044276588	99.35047319	100.3890853	102.0108651	104.7829358	107.9566031	111.2321213	114.2701285	116.1301284	117.3552032
61–61.99 months	−0.077206672	108.5436278	0.044344632	99.88469514	100.9289069	102.5598541	105.348792	108.5436278	111.8430758	114.9051683	116.780812	118.0165629
62–62.99 months	−0.09572283	109.1315521	0.044410436	100.4197939	101.4696357	103.1097819	105.9155982	109.1315521	112.4548114	115.5408235	117.4319846	118.6783183
63–63.99 months	−0.113225128	109.7201531	0.044474084	100.9555286	102.0110354	103.6604184	106.4831306	109.7201531	113.0670984	116.1768496	118.0833889	119.3402023
64–64.99 months	−0.129665689	110.3091934	0.044535662	101.4916463	102.5528574	104.2115203	107.0511517	110.3091934	113.6796918	116.8129879	118.7347537	120.0019338
65–65.99 months	−0.145002179	110.8984228	0.044595254	102.0278838	103.0948423	104.762833	107.6194116	110.8984228	114.2923342	117.4489667	119.3857953	120.6632194
66–66.99 months	−0.159197885	111.4875806	0.044652942	102.5639698	103.6367221	105.3140925	108.1876502	111.4875806	114.9047572	118.0845041	120.03622	121.3237564
67–67.99 months	−0.172221748	112.0763967	0.044708809	103.0996264	104.1782217	105.8650274	108.7555991	112.0763967	115.5166834	118.7193096	120.685726	121.9832342
68–68.99 months	−0.184048358	112.6645943	0.044762936	103.6345709	104.7190606	106.4153599	109.3229831	112.6645943	116.1278283	119.3530862	121.3340057	122.6413368
69–69.99 months	−0.194660215	113.2518902	0.044815402	104.1685175	105.258955	106.9648081	109.8895213	113.2518902	116.7379017	119.9855318	121.9807474	123.297745
70–70.99 months	−0.204030559	113.8380006	0.044866288	104.7011761	105.797617	107.5130874	110.4549317	113.8380006	117.3466121	120.6163423	122.6256361	123.9521353
71–71.99 months	−0.212174408	114.4226317	0.044915672	105.2322625	106.3347618	108.0599112	111.0189247	114.4226317	117.9536599	121.2452109	123.2683596	124.6041916
72–72.99 months	−0.219069129	115.0054978	0.044963636	105.7614857	106.8701003	108.6049935	111.5812164	115.0054978	118.5587525	121.8718331	123.9086035	125.2535916
73–73.99 months	−0.224722166	115.5863089	0.045010259	106.2885612	107.4033481	109.148049	112.1415202	115.5863089	119.1615941	122.4959057	124.5460585	125.9000218
74–74.99 months	−0.229140412	116.1647782	0.045055624	106.8132066	107.9342229	109.6887954	112.6995522	116.1647782	119.7618926	123.1171295	125.1804203	126.5431735
75–75.99 months	−0.232335686	116.7406221	0.045099817	107.3351443	108.4624465	110.2269537	113.2550319	116.7406221	120.3593603	123.7352109	125.8113907	127.1827453
76–76.99 months	−0.234324563	117.3135622	0.045142924	107.8541019	108.987746	110.7622502	113.8076835	117.3135622	120.9537147	124.3498634	126.4386798	127.8184451
77–77.99 months	−0.235128195	117.8833259	0.045185036	108.3698135	109.5098548	111.2944168	114.3572371	117.8833259	121.5446807	124.9608087	127.0620077	128.4499914
78–78.99 months	−0.234772114	118.4496481	0.045226249	108.8820206	110.0285133	111.8231928	114.9034294	118.4496481	122.1319914	125.5677788	127.6811055	129.0771148
79–79.99 months	−0.233286033	119.0122722	0.045266662	109.3904733	110.5434704	112.3483251	115.4460056	119.0122722	122.7153896	126.1705167	128.2957169	129.69956
80–80.99 months	−0.230703633	119.5709513	0.045306383	109.8949308	111.0544841	112.8695701	115.9847196	119.5709513	123.2946291	126.7687784	128.9056	130.3170863
81–81.99 months	−0.227062344	120.1254495	0.045345524	110.3951624	111.5613221	113.3866939	116.5193358	120.1254495	123.8694758	127.3623338	129.5105281	130.9294701
82–82.99 months	−0.222403111	120.6755427	0.045384203	110.890948	112.0637632	113.8994733	117.0496296	120.6755427	124.4397092	127.9509681	130.1102914	131.5365053
83–83.99 months	−0.216770161	121.22102	0.045422551	111.3820796	112.5615976	114.407697	117.5753884	121.22102	125.0051231	128.5344832	130.7046982	132.1380052
84–84.99 months	−0.210210748	121.7616844	0.045460702	111.868361	113.054628	114.9111662	118.0964128	121.7616844	125.5655273	129.1126986	131.2935761	132.7338033
85–85.99 months	−0.202774891	122.2973542	0.045498803	112.3496093	113.54267	115.4096953	118.6125173	122.2973542	126.1207484	129.6854529	131.876773	133.323755
86–86.99 months	−0.194515104	122.827864	0.045537012	112.825655	114.0255532	115.9031127	119.1235313	122.827864	126.6706308	130.2526047	132.4541587	133.9077383
87–87.99 months	−0.185486099	123.3530652	0.045575495	113.2963432	114.5031216	116.391262	119.6293	123.3530652	127.2150383	130.8140342	133.025626	134.4856552
88–88.99 months	−0.175744476	123.8728276	0.045614432	113.7615336	114.9752341	116.874002	120.1296849	123.8728276	127.7538545	131.3696436	133.5910912	135.0574328
89–89.99 months	−0.165348396	124.38704	0.045654016	114.2211014	115.4417656	117.351208	120.6245654	124.38704	128.2869845	131.9193587	134.150496	135.6230245
90–90.99 months	−0.15435722	124.8956114	0.04569445	114.674938	115.9026074	117.8227724	121.113839	124.8956114	128.8143555	132.4631302	134.7038082	136.1824107
91–91.99 months	−0.142831123	125.398472	0.045735953	115.1229513	116.3576679	118.2886054	121.5974226	125.398472	129.3359181	133.000934	135.2510227	136.7356
92–92.99 months	−0.130830669	125.895574	0.045778759	115.5650666	116.8068731	118.7486357	122.0752529	125.895574	129.8516474	133.5327731	135.7921628	137.2826306
93–93.99 months	−0.118416354	126.3868929	0.045823114	116.001227	117.2501678	119.2028114	122.5472882	126.3868929	130.3615441	134.0586782	136.3272809	137.8235707
94–94.99 months	−0.105648092	126.8724284	0.04586928	116.4313942	117.6875155	119.651101	123.0135084	126.8724284	130.8656354	134.5787089	136.8564598	138.3585197
95–95.99 months	−0.092584657	127.3522056	0.045917535	116.8555488	118.1188998	120.0934937	123.4739166	127.3522056	131.3639763	135.0929548	137.3798137	138.8876092
96–96.99 months	−0.079283065	127.8262759	0.045968169	117.2736916	118.5443251	120.5300007	123.92854	127.8262759	131.8566506	135.6015364	137.8974887	139.411004
97–97.99 months	−0.065797888	128.2947187	0.04602149	117.6858437	118.9638171	120.9606563	124.3774309	128.2947187	132.3437724	136.1046066	138.4096645	139.9289024
98–98.99 months	−0.0521805	128.757642	0.046077818	118.092048	119.3774239	121.3855185	124.8206679	128.757642	132.8254867	136.602351	138.9165546	140.4415378
99–99.99 months	−0.03847825	129.2151839	0.046137487	118.4923693	119.7852171	121.8046703	125.2583572	129.2151839	133.3019713	137.0949894	139.4184075	140.9491785

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
100–100.99 months	–0.024733545	129.6675143	0.046200842	118.8868959	120.1872927	122.2182208	125.6906338	129.6675143	133.7734371	137.5827768	139.9155075	141.4521292
101–101.99 months	–0.010982868	130.1148354	0.04626824	119.2757403	120.5837721	122.6263066	126.1176628	130.1148354	134.2401302	138.0660041	140.4081749	141.9507308
102–102.99 months	0.002744306	130.5573839	0.046340046	119.6590402	120.9748035	123.029093	126.5396411	130.5573839	134.7023324	138.5449986	140.8967672	142.4453609
103–103.99 months	0.016426655	130.995432	0.046416629	120.0369603	121.3605632	123.4267753	126.9567984	130.995432	135.1603626	139.0201256	141.3816789	142.936434
104–104.99 months	0.030052231	131.4292887	0.046498361	120.4096928	121.7412571	123.8195805	127.3693994	131.4292887	135.6145777	139.4917879	141.8633417	143.4244013
105–105.99 months	0.043619747	131.8593015	0.046585611	120.7774598	122.1171219	124.2077692	127.7777448	131.8593015	136.0653737	139.9604267	142.3422248	143.9097502
106–106.99 months	0.05713988	132.2858574	0.046678741	121.140514	122.4884272	124.5916364	128.1821733	132.2858574	136.5131864	140.4265216	142.818834	144.3930034
107–107.99 months	0.070636605	132.7093845	0.046778099	121.4991408	122.8554769	124.9715143	128.5830629	132.7093845	136.9584917	140.8905903	143.2937108	144.8747179
108–108.99 months	0.08414848	133.1303527	0.04688401	121.8536605	123.2186111	125.3477734	128.9808329	133.1303527	137.4018066	141.3531879	143.7674316	145.3554829
109–109.99 months	0.097729873	133.5492749	0.046996769	122.2044292	123.5782083	125.7208245	129.3759451	133.5492749	137.8436884	141.8149059	144.2406053	145.8359173
110–110.99 months	0.111452039	133.9667073	0.047116633	122.551842	123.9346869	126.0911208	129.7689053	133.9667073	138.2847346	142.2763706	144.7138712	146.3166671
111–111.99 months	0.125404005	134.3832499	0.047243801	122.8963342	124.2885075	126.4591593	130.1602643	134.3832499	138.7255822	142.7382405	145.1878952	146.798401
112–112.99 months	0.13969316	134.7995463	0.047378413	123.2383839	124.6401749	126.8254825	130.5506193	134.7995463	139.1669053	143.2012034	145.6633664	147.2818057
113–113.99 months	0.154445482	135.2162826	0.047520521	123.5785142	124.9902397	127.1906801	130.9406135	135.2162826	139.6094137	143.6659721	146.1409913	147.7675803
114–114.99 months	0.169805275	135.634186	0.047670085	123.9172948	125.3393004	127.5553896	131.330937	135.634186	140.0538485	144.1332799	146.6214882	148.2564292
115–115.99 months	0.185934346	136.0540223	0.047826946	124.2553446	125.6880049	127.9202978	131.7223254	136.0540223	140.5009788	144.6038739	147.1055797	148.7490543
116–116.99 months	0.203010488	136.4765925	0.04799081	124.5933332	126.0370512	128.2861404	132.1155587	136.4765925	140.9515953	145.0785079	147.5939843	149.2461456
117–117.99 months	0.2212252	136.9027281	0.048161228	124.9319822	126.3871885	128.6537014	132.5114586	136.9027281	141.406504	145.5579335	148.0874065	149.7483713
118–118.99 months	0.240780542	137.3332846	0.04833757	125.2720662	126.7392174	129.0238124	132.9108849	137.3332846	141.8665172	146.0428902	148.586526	150.2563656
119–119.99 months	0.261885086	137.7691339	0.048519011	125.6144133	127.0939883	129.3973496	133.3147302	137.7691339	142.3324443	146.5340936	149.0919854	150.7707169
120–120.99 months	0.284748919	138.2111552	0.048704503	125.9599043	127.4524005	129.7752299	133.7239135	138.2111552	142.8050794	147.0322225	149.6043767	151.2919534
121–121.99 months	0.309577733	138.6602228	0.048892759	126.3094709	127.8153983	130.1584061	134.1393714	138.6602228	143.2851879	147.5379045	150.1242269	151.8205297
122–122.99 months	0.336566048	139.1171933	0.049082239	126.6640931	128.1839668	130.5478595	134.5620476	139.1171933	143.7734919	148.0517004	150.6519828	152.3568114
123–123.99 months	0.365889711	139.5828898	0.049271137	127.0247941	128.5591249	130.9445907	134.9928804	139.5828898	144.2706527	148.5740881	151.1879951	152.9010603
124–124.99 months	0.397699038	140.0580848	0.049457371	127.3926332	128.9419168	131.3496084	135.4327874	140.0580848	144.7772534	149.1054445	151.7325029	153.4534201
125–125.99 months	0.432104409	140.5434787	0.049638596	127.7686986	129.3334014	131.7639151	135.8826474	140.5434787	145.2937779	149.6460289	152.2856189	154.0139039
126–126.99 months	0.46917993	141.0396832	0.049812203	128.1540923	129.7346372	132.1884911	136.3432832	141.0396832	145.8205935	150.1959657	152.8473131	154.5823786
127–127.99 months	0.508943272	141.5471945	0.049975355	128.5499184	130.1466666	132.6242751	136.8154369	141.5471945	146.3579283	150.7552278	153.4174019	155.1585578
128–128.99 months	0.551354277	142.0663731	0.050125012	128.9572634	130.5704957	133.072142	137.299748	142.0663731	146.9058529	151.3236226	153.9955367	155.741993
129–129.99 months	0.596307363	142.59742	0.050257992	129.3771753	131.0070717	133.5328789	137.7967284	142.59742	147.4642617	151.9007796	154.581196	156.3320686
130–130.99 months	0.643626542	143.1403553	0.050371024	129.8106385	131.4572565	134.0071586	138.3067365	143.1403553	148.0328573	152.4861414	155.1736815	156.9280012
131–131.99 months	0.693062173	143.6949981	0.050460835	130.2585454	131.9217986	134.4955119	138.8299523	143.6949981	148.6111378	153.0789588	155.7721177	157.5288429
132–132.99 months	0.744289752	144.2609497	0.050524236	130.7216652	132.4013028	134.9982982	139.3663536	144.2609497	149.1983881	153.6782905	156.3754566	158.1334886
133–133.99 months	0.79691098	144.8375809	0.050558224	131.2006102	132.8961979	135.5156778	139.9156938	144.8375809	149.7936767	154.2830074	156.9824866	158.740688
134–134.99 months	0.85045728	145.4240246	0.050560083	131.6958014	133.4067049	136.0475846	140.4774848	145.4240246	150.3958583	154.8918033	157.591847	159.3490618
135–135.99 months	0.904395871	146.0191748	0.050527494	132.2074327	133.9328066	136.5937022	141.0509836	146.0191748	151.0035823	155.5032105	158.2020466	159.9571223
136–136.99 months	0.958138449	146.621692	0.050458634	132.7354383	134.4742195	137.1534445	141.6351863	146.621692	151.6153083	156.1156207	158.8114866	160.5632969
137–137.99 months	1.011054559	147.2300177	0.050352269	133.2794613	135.0303699	137.7259419	142.228829	147.2300177	152.2293288	156.7273114	159.4184879	161.1659545
138–138.99 months	1.062474568	147.8423918	0.050207825	133.8388331	135.6003795	138.3100351	142.8303943	147.8423918	152.8437944	157.336476	160.0213216	161.7634371
139–139.99 months	1.111727029	148.4568879	0.050025434	134.4125492	136.1830524	138.9042785	143.4381342	148.4568879	153.4567526	157.9412574	160.6182378	162.3540831
140–140.99 months	1.158135105	149.0714413	0.049805967	134.9992687	136.7768804	139.5069517	144.0500909	149.0714413	154.0661803	158.5397832	161.2075007	162.9362629
141–141.99 months	1.201050821	149.6838943	0.049551023	135.5973139	137.3800519	140.1160824	144.6641345	149.6838943	154.6700274	159.1302018	161.7874182	163.5084028
142–142.99 months	1.239852328	150.2920328	0.049262895	136.2046931	137.9904798	140.7294775	145.2779986	150.2920328	155.2662534	159.710717	162.3563754	164.0690181
143–143.99 months	1.274006058	150.8936469	0.048944504	136.8191174	138.6058289	141.3447662	145.8893375	150.8936469	155.8528786	160.2796226	162.9128551	164.6167234
144–144.99 months	1.303044695	151.4865636	0.048599314	137.4380555	139.2235689	141.9594471	146.4957662	151.4865636	156.4280126	160.8353311	163.4554684	165.1502647
145–145.99 months	1.326605954	152.0686985	0.048231224	138.0587804	139.8410247	142.5709442	147.0949169	152.0686985	156.9898953	161.3763995	163.9829705	165.6685285
146–146.99 months	1.344443447	152.6380955	0.047844442	138.6784334	140.4554388	143.1766639	147.6844892	152.6380955	157.5369262	161.9015501	164.4942764	166.1705539
147–147.99 months	1.356437773	153.1929631	0.047443362	139.2940935	141.064036	143.7740547	148.2622979	153.1929631	158.0676887	162.4096857	164.9884705	166.6555396
148–148.99 months	1.362602695	153.7317031	0.04703243	139.902849	141.6640898	144.3606631	148.8263158	153.7317031	158.5809683	162.8998985	165.4648118	167.1228459

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile											
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
149–149.99 months	1.363085725	154.2529332	0.046616026	140.5018697	142.2529855	144.9341866	149.3747099	154.2529332	159.0757636	163.3714746	165.9227345	167.5719943
150–150.99 months	1.358162799	154.755501	0.046198356	141.0884738	142.8282787	145.4925187	149.9058698	154.755501	159.5512908	163.8238923	166.3618445	168.0026622
151–151.99 months	1.348227142	155.2384904	0.04578335	141.6601883	143.3877452	146.0337866	150.4184277	155.2384904	160.006982	164.2568163	166.7819123	168.4146759
152–152.99 months	1.333772923	155.7012216	0.045374597	142.2147984	143.9294218	146.5563788	150.9112703	155.7012216	160.4424774	164.6700879	167.1828627	168.8080012
153–153.99 months	1.315374704	156.1432438	0.044975281	142.7503859	144.4516354	147.0589626	151.3835413	156.1432438	160.8576139	165.0637118	167.5647631	169.1827317
154–154.99 months	1.293664024	156.564323	0.044588148	143.2653544	144.9530205	147.5404925	151.8346381	156.564323	161.252409	165.4378408	167.9278093	169.5390766
155–155.99 months	1.269304678	156.9644258	0.044215488	143.7584411	145.4325259	148.0002085	152.2642007	156.9644258	161.6270427	165.7927589	168.2723104	169.8773471
156–156.99 months	1.242968236	157.3436995	0.043859135	144.2287179	145.8894106	148.437627	152.6720956	157.3436995	161.9818377	166.1288638	168.5986736	170.1979436
157–157.99 months	1.21531127	157.7024507	0.04352048	144.6755805	146.3232308	148.8525242	153.0583966	157.7024507	162.317239	166.4466488	168.9073892	170.5013414
158–158.99 months	1.186955477	158.0411233	0.043200497	145.0987292	146.7338197	149.2449147	153.4233611	158.0411233	162.633793	166.7466859	169.1990151	170.7880784
159–159.99 months	1.158471522	158.3602756	0.042899776	145.4981426	147.1212613	149.6150259	153.7674066	158.3602756	162.9321282	167.0296087	169.474163	171.0587419
160–160.99 months	1.130367088	158.6605588	0.042618565	145.8740473	147.4858611	149.9632704	154.0910856	158.6605588	163.2129368	167.2960978	169.7334849	171.3139575
161–161.99 months	1.103079209	158.9426964	0.042356812	146.2268836	147.8281145	150.2902174	154.3950608	158.9426964	163.476957	167.5468664	169.9776618	171.5543778
162–162.99 months	1.076970655	159.2074654	0.042114211	146.5572714	148.148675	150.5965645	154.6800825	159.2074654	163.7249588	167.7826481	170.207392	171.780673
163–163.99 months	1.052329922	159.455679	0.041890247	146.8659759	148.4483225	150.8831097	154.9469659	159.455679	163.9577297	168.0041861	170.4233822	171.9935219
164–164.99 months	1.029374161	159.688172	0.04168424	147.1538752	148.7279342	151.1507267	155.1965718	159.688172	164.1760637	168.2122241	170.6263392	172.1936047
165–165.99 months	1.008254396	159.9057871	0.041495379	147.4219304	148.9884574	151.4003414	155.4297888	159.9057871	164.3807514	168.4074983	170.8169629	172.3815959
166–166.99 months	0.989062282	160.1093647	0.041322765	147.6711585	149.2308852	151.6329115	155.6475179	160.1093647	164.572572	168.5907313	170.9959407	172.5581591
167–167.99 months	0.971837799	160.299733	0.041165437	147.902609	149.4562355	151.8494087	155.8506598	160.299733	164.7522868	168.7626268	171.1639423	172.7239426
168–168.99 months	0.95657215	160.4776996	0.041022401	148.1173446	149.6655332	152.0508033	156.0401024	160.4776996	164.920633	168.9238654	171.3216174	172.8795764
169–169.99 months	0.94324228	160.6440526	0.040892651	148.3164186	149.8597926	152.238053	156.2167175	160.6440526	165.0783248	169.0751026	171.469589	173.0256638
170–170.99 months	0.931767062	160.7995428	0.040775193	148.5008727	150.0400107	152.4120911	156.3813442	160.7995428	165.2260411	169.2169651	171.6084579	173.1627906
171–171.99 months	0.922058291	160.9448916	0.040669052	148.6717163	150.2071532	152.5738202	156.5347914	160.9448916	165.3644316	169.3500504	171.7387957	173.2915138
172–172.99 months	0.914012643	161.0807857	0.040573288	148.8299213	150.3621482	152.7241057	156.6778321	161.0807857	165.4941133	169.4749261	171.8611461	173.4123635
173–173.99 months	0.907516917	161.2078755	0.040487005	148.976416	150.5058813	152.8637721	156.8112003	161.2078755	165.6156697	169.5921291	171.9760242	173.5258431
174–174.99 months	0.902452436	161.3267744	0.040409354	149.1120814	150.6391923	152.9936001	156.9355896	161.3267744	165.7296508	169.7021662	172.0839168	173.6324287
175–175.99 months	0.898698641	161.4380593	0.040339537	149.2377485	150.7628729	153.1143251	157.0516529	161.4380593	165.8365737	169.8055142	172.1852824	173.7325694
176–176.99 months	0.896143482	161.5422726	0.040276811	149.3541954	150.877665	153.2266371	157.1600033	161.5422726	165.9369248	169.9026209	172.2805514	173.8266863
177–177.99 months	0.894659668	161.639917	0.040220488	149.4621532	150.9842639	153.3311804	157.2612106	161.639917	166.0311556	169.9939056	172.3701297	173.9151788
178–178.99 months	0.89413892	161.7314645	0.040169932	149.5622993	151.0833153	153.4285552	157.3558081	161.7314645	166.1196904	170.0797608	172.4543957	173.9984185
179–179.99 months	0.894475371	161.8173534	0.040124562	149.6552628	151.1754186	153.5193185	157.4442908	161.8173534	166.202924	170.160553	172.5337038	174.0767538
180–180.99 months	0.895569834	161.8979913	0.040083845	149.7416255	151.2611287	153.6039864	157.5271178	161.8979913	166.281224	170.236624	172.6083849	174.1505102
181–181.99 months	0.897330209	161.9737558	0.040047295	149.8219242	151.3409575	153.6830356	157.6047139	161.9737558	166.3549321	170.3082921	172.6787478	174.2199918
182–182.99 months	0.899671635	162.0449969	0.040014473	149.8966533	151.415377	153.7569057	157.6774719	162.0449969	166.4243655	170.3758539	172.7450799	174.2854819
183–183.99 months	0.902516442	162.1120386	0.03998498	149.9662668	151.4848208	153.8260015	157.7457539	162.1120386	166.4898188	170.4395847	172.8076491	174.3472447
184–184.99 months	0.905793969	162.17518	0.039958458	150.0311812	151.5496874	153.8906954	157.809894	162.17518	166.5515647	170.4997408	172.8667045	174.405526
185–185.99 months	0.909440266	162.2346979	0.039934584	150.0917784	151.610342	153.951329	157.8701998	162.2346979	166.6098562	170.5565599	172.9224777	174.4605545
186–186.99 months	0.913397733	162.2908474	0.039913066	150.1484074	151.6671193	154.0082162	157.9269542	162.2908474	166.6649274	170.6102627	172.9751838	174.5125428
187–187.99 months	0.91761471	162.343864	0.039893644	150.2013879	151.7203255	154.0616446	157.9804176	162.343864	166.7169951	170.6610542	173.025023	174.5616886
188–188.99 months	0.922045055	162.3939652	0.039876087	150.2510113	151.7702407	154.1118775	158.0308292	162.3939652	166.7662599	170.7091243	173.0721808	174.6081757
189–189.99 months	0.926647697	162.4413513	0.039860185	150.2975443	151.8171212	154.1591564	158.0784088	162.4413513	166.8129074	170.7546494	173.1168298	174.6521747
190–190.99 months	0.931386217	162.4862071	0.039845754	150.3412298	151.8612008	154.2037023	158.1233583	162.4862071	166.8571093	170.7977929	173.1591301	174.6938442
191–191.99 months	0.93622842	162.5287029	0.039832629	150.3822898	151.9026934	154.2457175	158.1658633	162.5287029	166.8990246	170.8387064	173.1992303	174.7333314
192–192.99 months	0.941145943	162.5689958	0.039820663	150.4209266	151.9417942	154.2853872	158.2060942	162.5689958	166.9388003	170.8775306	173.2372685	174.7707732
193–193.99 months	0.94611388	162.6072309	0.039809725	150.4573249	151.9786817	154.3228809	158.2442076	162.6072309	166.9765723	170.914396	173.2733728	174.8062967
194–194.99 months	0.95111043	162.6435418	0.0397997	150.4916531	152.013519	154.3583538	158.2803474	162.6435418	167.0124668	170.9494236	173.3076624	174.8400201
195–195.99 months	0.956116576	162.6780519	0.039790485	150.524065	152.0464549	154.3919483	158.3146459	162.6780519	167.0466004	170.9827258	173.3402478	174.8720532
196–196.99 months	0.961115792	162.7108751	0.039781991	150.5547008	152.0776257	154.4237944	158.3472249	162.7108751	167.0790811	171.014407	173.3712319	174.902498
197–197.99 months	0.966093766	162.7421168	0.039774136	150.5836887	152.1071558	154.4540118	158.3781962	162.7421168	167.110009	171.0445641	173.4007102	174.9314494

Table 23. *L, M,* and *S* parameters and selected smoothed percentiles for stature (in centimeters) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile								
				3rd	5th	10th	25th	50th	75th	90th	95th	97th
Girls—Con.												
198–198.99 months	0.971038162	162.7718741	0.03976685	150.6111457	152.1351593	154.4827098	158.407663	162.7718741	167.1394771	171.0732871	173.4287717	174.9589959
199–199.99 months	0.975938391	162.8002371	0.03976007	150.6371789	152.1617405	154.509989	158.4357202	162.8002371	167.1675715	171.1006598	173.455499	174.9852197
200–200.99 months	0.980785418	162.8272889	0.039753741	150.661886	152.1869949	154.5359417	158.4624554	162.8272889	167.1943721	171.1267599	173.4809691	175.0101973
201–201.99 months	0.985571579	162.8531067	0.039747815	150.6853568	152.2110102	154.5606528	158.4879492	162.8531067	167.2199532	171.1516601	173.5052538	175.034
202–202.99 months	0.99029042	162.8777619	0.039742249	150.7076733	152.2338667	154.5842002	158.5122763	162.8777619	167.244384	171.1754277	173.5284198	175.0566944
203–203.99 months	0.994936555	162.9013208	0.039737004	150.7289106	152.2556383	154.6066558	158.5355056	162.9013208	167.2677286	171.1981258	173.5505296	175.0783424
204–204.99 months	0.999505539	162.9238449	0.039732048	150.749138	152.2763929	154.6280858	158.5577008	162.9238449	167.2900467	171.2198128	173.5716411	175.099002
205–205.99 months	1.003993753	162.9453912	0.039727352	150.7684187	152.296193	154.6485512	158.578921	162.9453912	167.3113942	171.2405436	173.5918087	175.1187272
206–206.99 months	1.0083983	162.9660131	0.03972289	150.7868111	152.3150959	154.6681084	158.5992207	162.9660131	167.3318229	171.2603693	173.6110831	175.1375685
207–207.99 months	1.012716921	162.9857599	0.03971864	150.8043689	152.3331548	154.6868095	158.6186507	162.9857599	167.3513812	171.2793375	173.6295117	175.155573
208–208.99 months	1.016947912	163.0046776	0.039714581	150.8211416	152.3504187	154.7047027	158.6372582	163.0046776	167.3701145	171.2974929	173.6471389	175.1727851
209–209.99 months	1.021090055	163.0228094	0.039710697	150.8371748	152.3669327	154.7218327	158.6550869	163.0228094	167.388065	171.3148774	173.6640061	175.1892459
210–210.99 months	1.025142554	163.0401953	0.039706971	150.8525106	152.3827387	154.7382408	158.6721776	163.0401953	167.4052723	171.33153	173.6801522	175.2049944
211–211.99 months	1.029104983	163.0568727	0.039703391	150.8671882	152.3978755	154.7539655	158.6885682	163.0568727	167.4217734	171.3474874	173.6956138	175.2200667
212–212.99 months	1.032977233	163.0728768	0.039699945	150.8812435	152.412379	154.7690427	158.7042942	163.0728768	167.437603	171.362784	173.710425	175.2344971
213–213.99 months	1.036759475	163.0882404	0.039696623	150.8947102	152.4262827	154.7835054	158.7193886	163.0882404	167.4527938	171.3774521	173.7246179	175.2483174
214–214.99 months	1.040452117	163.1029943	0.039693415	150.9076191	152.4396177	154.7973849	158.7338824	163.1029943	167.4673763	171.3915221	173.7382228	175.2615577
215–215.99 months	1.044055774	163.1171673	0.039690313	150.9199994	152.4524128	154.81071	158.7478045	163.1171673	167.4813792	171.4050225	173.751268	175.2742464
216–216.99 months	1.047571238	163.1307866	0.039687311	150.9318778	152.464695	154.8235077	158.7611821	163.1307866	167.4948296	171.4179802	173.7637802	175.2864101
217–217.99 months	1.050999451	163.1438776	0.039684402	150.9432795	152.4764895	154.8358035	158.7740404	163.1438776	167.5077529	171.4304205	173.7757847	175.2980736
218–218.99 months	1.054341482	163.1564644	0.039681581	150.9542279	152.4878198	154.8476208	158.7864036	163.1564644	167.520173	171.4423671	173.787305	175.3092608
219–219.99 months	1.057598512	163.1685697	0.039678842	150.9647448	152.498708	154.8589821	158.798294	163.1685697	167.5321128	171.4538427	173.7983636	175.3199938
220–220.99 months	1.060771808	163.1802146	0.039676182	150.9748507	152.5091747	154.8699082	158.8097328	163.1802146	167.5435933	171.4648684	173.8089816	175.3302936
221–221.99 months	1.063862715	163.1914194	0.039673596	150.9845649	152.5192393	154.8804186	158.8207399	163.1914194	167.554635	171.4754644	173.8191789	175.3401801
222–222.99 months	1.066872639	163.202203	0.039671082	150.9939053	152.52892	154.8905318	158.8313341	163.202203	167.5652567	171.4856495	173.8289744	175.349672
223–223.99 months	1.069803036	163.2125835	0.039668635	151.0028889	152.5382338	154.9002654	158.8415332	163.2125835	167.5754766	171.4954418	173.8383858	175.358787
224–224.99 months	1.072655401	163.2225779	0.039666254	151.0115315	152.5471971	154.9096356	158.851354	163.2225779	167.5853118	171.5048583	173.8474302	175.367542
225–225.99 months	1.075431258	163.2322024	0.039663936	151.0198482	152.5558248	154.9186579	158.8608124	163.2322024	167.5947785	171.5139151	173.8561235	175.3759527
226–226.99 months	1.078132156	163.2414722	0.039661679	151.0278532	152.5641315	154.9273472	158.8699234	163.2414722	167.6038921	171.5226274	173.8644808	175.3840343
227–227.99 months	1.080759655	163.2504019	0.039659481	151.0355596	152.5721307	154.9357171	158.8787012	163.2504019	167.6126671	171.5310098	173.8725166	175.391801
228–228.99 months	1.083315329	163.2590052	0.039657339	151.0429803	152.5798353	154.9437809	158.8871595	163.2590052	167.6211174	171.5390761	173.8802445	175.3992664
229–229.99 months	1.085800751	163.2672954	0.039655252	151.0501271	152.5872574	154.9515511	158.8953111	163.2672954	167.6292563	171.5468394	173.8876774	175.4064433
230–230.99 months	1.088217496	163.2752848	0.039653218	151.0570114	152.5944085	154.9590395	158.9031682	163.2752848	167.6370963	171.5543121	173.8948277	175.4133439
231–231.99 months	1.090567133	163.2829854	0.039651237	151.0636438	152.6012996	154.9662574	158.9107425	163.2829854	167.6446494	171.561506	173.9017071	175.4199799
232–232.99 months	1.092851222	163.2904086	0.039649306	151.0700346	152.6079412	154.9732154	158.918045	163.2904086	167.6519269	171.5684326	173.9083268	175.4263623
233–233.99 months	1.095071313	163.297565	0.039647424	151.0761934	152.6143431	154.9799237	158.9250863	163.297565	167.6589397	171.5751024	173.9146973	175.4325015
234–234.99 months	1.097228939	163.304465	0.039645591	151.0821295	152.6205147	154.9863922	158.9318765	163.304465	167.6656981	171.5815258	173.9208289	175.4384076
235–235.99 months	1.099325619	163.3111185	0.039643804	151.0878515	152.626465	154.9926299	158.9384252	163.3111185	167.6722121	171.5877126	173.9267311	175.4440902
236–236.99 months	1.101362852	163.3175349	0.039642063	151.0933679	152.6322026	154.9986458	158.9447416	163.3175349	167.678491	171.5936721	173.9324132	175.4495583
237–237.99 months	1.103342119	163.3237231	0.039640367	151.0986866	152.6377356	155.0044483	158.9508345	163.3237231	167.684544	171.5994132	173.9378839	175.4548206
238–238.99 months	1.105264876	163.3296918	0.039638715	151.1038152	152.6430718	155.0100454	158.9567122	163.3296918	167.6903797	171.6049444	173.9431517	175.4598853
239–239.99 months	1.107132561	163.3354491	0.039637105	151.1087609	152.6482187	155.0154449	158.9623829	163.3354491	167.6960062	171.6102738	173.9482244	175.4647604

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys													
24–24.99 months	−1.982373595	16.54777487	0.080127429	14.50347667	14.71929257	15.07117474	15.71962876	16.54777487	17.52129279	18.11954923	18.56110634	19.27889813	19.79194014
25–25.99 months	−1.924100169	16.49442763	0.079233994	14.46882381	14.68360841	15.03335725	15.67634464	16.49442763	17.45135039	18.03668013	18.46729593	19.16465965	19.66102345
26–26.99 months	−1.86549793	16.44259552	0.078389356	14.43459737	14.64843329	14.99619505	15.634035	16.44259552	17.38383656	17.95700228	18.37736191	19.05567423	19.5365754
27–27.99 months	−1.807261899	16.3922434	0.077593501	14.40082828	14.61378626	14.95969047	15.5926798	16.3922434	17.3187102	17.88047101	18.29125345	18.9518675	19.41848805
28–28.99 months	−1.750118905	16.34333654	0.076846462	14.36754718	14.57968578	14.92384514	15.55225853	16.34333654	17.2559313	17.80704259	18.20892041	18.85316529	19.30665411
29–29.99 months	−1.69481584	16.29584097	0.076148308	14.33478414	14.54614966	14.88866003	15.51275057	16.29584097	17.19546093	17.73667414	18.1303131	18.75949359	19.20096691
30–30.99 months	−1.642106779	16.24972371	0.075499126	14.30256837	14.51319492	14.85413557	15.47413549	16.24972371	17.13726129	17.66932346	18.05538214	18.67077841	19.10132056
31–31.99 months	−1.592744414	16.20495268	0.074898994	14.27092833	14.48083795	14.82027189	15.43639319	16.20495268	17.0812953	17.6049486	17.98407812	18.58694589	19.00761051
32–32.99 months	−1.547442391	16.16149871	0.074347997	14.23988971	14.44909329	14.7870687	15.39950521	16.16149871	17.02752831	17.54350898	17.91635198	18.50792131	18.91973125
33–33.99 months	−1.506902601	16.11933258	0.073846139	14.2094782	14.41797561	14.7545259	15.36345335	16.11933258	16.97592485	17.48496295	17.85215384	18.43363072	18.83758072
34–34.99 months	−1.471770047	16.07842758	0.07339337	14.17971698	14.38749811	14.72264343	15.32822125	16.07842758	16.92645101	17.42926933	17.79143359	18.3639996	18.76105711
35–35.99 months	−1.442628957	16.03875896	0.072989551	14.15062715	14.35767293	14.69142152	15.2937943	16.03875896	16.87907357	17.37638677	17.73414053	18.29895323	18.69005992
36–36.99 months	−1.419991255	16.00030401	0.072634432	14.12222757	14.32851119	14.66086088	15.26015988	16.00030401	16.8337599	17.32627356	17.68022325	18.23841666	18.62449011
37–37.99 months	−1.404277619	15.96304277	0.072327649	14.09453413	14.30002256	14.63096272	15.22730791	15.96304277	16.79047852	17.27888795	17.62962965	18.1823144	18.5642493
38–38.99 months	−1.39586317	15.92695418	0.07206864	14.06756329	14.27221761	14.60172936	15.1952288	15.92695418	16.74919525	17.23418554	17.58230587	18.13057244	18.50924478
39–39.99 months	−1.394935252	15.89202582	0.071856805	14.04132288	14.24510202	14.57316316	15.16391901	15.89202582	16.70988247	17.19212545	17.53819888	18.08311311	18.45937719
40–40.99 months	−1.401671596	15.85824093	0.071691278	14.0158243	14.21868433	14.54526806	15.13337382	15.85824093	16.67250668	17.15266201	17.49725289	18.03986198	18.41455697
41–41.99 months	−1.416100312	15.82558822	0.071571093	13.99107332	14.19297011	14.51804847	15.10359281	15.82558822	16.63703787	17.11575098	17.45941207	18.00074262	18.37469187
42–42.99 months	−1.438164899	15.79405728	0.071495113	13.96707439	14.16796472	14.49150978	15.07457728	15.79405728	16.60344521	17.08134677	17.42461935	17.96567903	18.33969264
43–43.99 months	−1.467669032	15.76364255	0.071462106	13.94382698	14.14367089	14.4656578	15.04633235	15.76364255	16.57170092	17.04940504	17.39281759	17.9345935	18.30946785
44–44.99 months	−1.504376347	15.73433668	0.071470646	13.9213319	14.12009269	14.44049947	15.01886319	15.73433668	16.54177412	17.0198786	17.36394785	17.90741007	18.28393204
45–45.99 months	−1.547942838	15.70613566	0.071519218	13.8995866	14.09723246	14.4160421	14.99217766	15.70613566	16.51363577	16.99272087	17.33795095	17.88405183	18.26299911
46–46.99 months	−1.597896397	15.67904062	0.071606277	13.87858352	14.07508966	14.392293	14.96628719	15.67904062	16.48726082	16.96788739	17.31476822	17.86443983	18.24657949
47–47.99 months	−1.653732283	15.65305192	0.071730167	13.85831582	14.05366443	14.36926	14.94120325	15.65305192	16.46262258	16.94533215	17.29433999	17.84849622	18.2345875
48–48.99 months	−1.714869347	15.62817269	0.071889214	13.83877404	14.03295533	14.34695084	14.91693911	15.62817269	16.43969657	16.92501028	17.27660684	17.8361423	18.22693633
49–49.99 months	−1.780673181	15.604408	0.072081737	13.81994711	14.01295984	14.32537305	14.89350913	15.604408	16.41845985	16.90687779	17.26150966	17.82729891	18.22353875
50–50.99 months	−1.850468473	15.58176458	0.072306081	13.80182253	13.99367445	14.30453377	14.87092845	15.58176458	16.39889119	16.89089179	17.24898984	17.8218865	18.22430691
51–51.99 months	−1.923551865	15.56025067	0.072560637	13.78438667	13.97509464	14.2844396	14.84921259	15.56025067	16.38097113	16.87701073	17.23898952	17.81982523	18.22915216
52–52.99 months	−1.999220429	15.5398746	0.07284384	13.76762605	13.95721572	14.26509665	14.82837662	15.5398746	16.36468088	16.86519374	17.23145142	17.82103559	18.23798637
53–53.99 months	−2.076707178	15.52064993	0.073154324	13.75152248	13.94002947	14.24650943	14.80843749	15.52064993	16.3500079	16.85540483	17.22632105	17.82543578	18.25071444
54–54.99 months	−2.155348017	15.50258427	0.073490667	13.73606368	13.92353116	14.22868271	14.7894083	15.50258427	16.33693462	16.8476049	17.22354286	17.83294744	18.26724918
55–55.99 months	−2.234438552	15.48568973	0.073851672	13.72123322	13.90771281	14.21161954	14.77130343	15.48568973	16.32544946	16.84175987	17.22306443	17.84349028	18.28749643
56–56.99 months	−2.313321723	15.46997718	0.074236235	13.70701599	13.89256678	14.19532216	14.75413556	15.46997718	16.31554106	16.8378366	17.22483458	17.85698505	18.31136265
57–57.99 months	−2.391381273	15.45545692	0.074643374	13.69339739	13.87808525	14.1797919	14.73791599	15.45545692	16.30719914	16.83580365	17.22880383	17.87335318	18.33875356
58–58.99 months	−2.468032491	15.44213961	0.075072264	13.68036242	13.86425959	14.16502885	14.72265501	15.44213961	16.30041561	16.83563223	17.23492502	17.89251642	18.36957256
59–59.99 months	−2.542781541	15.43003207	0.075522104	13.66789962	13.85108308	14.15103287	14.70836004	15.43003207	16.29517994	16.83729272	17.24315148	17.91439894	18.40372671
60–60.99 months	−2.61516595	15.41914163	0.07599225	13.65599683	13.83854804	14.13780261	14.69503764	15.41914163	16.29148397	16.84075838	17.25343909	17.93892524	18.44112021
61–61.99 months	−2.684789516	15.40947356	0.076482128	13.64464353	13.82664746	14.1253362	14.68269244	15.40947356	16.28931904	16.84600319	17.26574515	17.96602144	18.48165813
62–62.99 months	−2.751316949	15.40103139	0.076991232	13.63383056	13.81537489	14.11363117	14.67132735	15.40103139	16.28867619	16.85300198	17.28002846	17.99561523	18.52524599
63–63.99 months	−2.81445945	15.39381785	0.077519149	13.62354907	13.8047237	14.10268433	14.66094403	15.39381785	16.28954723	16.86173124	17.29624981	18.02763543	18.57178832
64–64.99 months	−2.87402476	15.38783094	0.07806539	13.61379452	13.79469004	14.09249299	14.65154144	15.38783094	16.29191982	16.87216519	17.31436954	18.06201396	18.62119533
65–65.99 months	−2.92984048	15.38306945	0.078629592	13.60456106	13.78526882	14.08305345	14.64311821	15.38306945	16.29578396	16.88428085	17.33435063	18.09868317	18.67337395
66–66.99 months	−2.981796828	15.37952958	0.079211369	13.595845	13.77645627	14.0743621	14.63567131	15.37952958	16.30112773	16.89805459	17.35615653	18.13757754	18.72823379
67–67.99 months	−3.029831343	15.37720582	0.079810334	13.58764387	13.76824936	14.06641528	14.62919656	15.37720582	16.30793819	16.91346275	17.37975148	18.17863327	18.78568583
68–68.99 months	−3.073924224	15.37609107	0.080426086	13.57995642	13.76064574	14.05920932	14.62368881	15.37609107	16.31620135	16.93048153	17.40510042	18.22178824	18.84564261
69–69.99 months	−3.114093476	15.37617677	0.081058206	13.57278245	13.75364373	14.05274063	14.619142	15.37617677	16.32590217	16.94908693	17.43216882	18.26698191	18.90801826
70–70.99 months	−3.15039004	15.37745304	0.081706249	13.56612272	13.7472423	14.04700569	14.61554938	15.37745304	16.33702456	16.96925461	17.46092258	18.31415529	18.97272855
71–71.99 months	−3.182893018	15.37990886	0.082369741	13.55997887	13.74144099	14.04200114	14.6129036	15.37990886	16.34955145	16.99095993	17.49132795	18.36325085	19.03969094
72–72.99 months	−3.21170511	15.38353217	0.083048178	13.55435329	13.73623987	14.03772376	14.61119682	15.38353217	16.36346484	17.01417786	17.52335144	18.41421242	19.10882456

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys—Con.													
73–73.99 months	−3.23694834	15.38831005	0.083741021	13.54924901	13.73163946	14.03417051	14.61042085	15.38831005	16.37874588	17.03888299	17.55695978	18.46698511	19.18005024
74–74.99 months	−3.25876011	15.39422883	0.0844477	13.54466964	13.72764072	14.03133851	14.61056719	15.39422883	16.39537493	17.06504953	17.59211982	18.52151524	19.25329044
75–75.99 months	−3.277281546	15.40127496	0.085167651	13.54061839	13.72424433	14.02922475	14.61162737	15.40127496	16.41333266	17.09265223	17.62879914	18.57774996	19.32846782
76–76.99 months	−3.292683774	15.40943252	0.085900184	13.53710097	13.72145289	14.02782718	14.61359223	15.40943252	16.43259653	17.12166319	17.66696377	18.63563816	19.4055104
77–77.99 months	−3.305124073	15.41868691	0.086644667	13.53412147	13.71926775	14.02714319	14.61645307	15.41868691	16.45314588	17.15205629	17.70658129	18.69512904	19.48434431
78–78.99 months	−3.314768951	15.42902273	0.087400421	13.53168472	13.71769094	14.0271705	14.62020097	15.42902273	16.47495885	17.18380454	17.74761885	18.75617288	19.56489823
79–79.99 months	−3.321785992	15.44042439	0.088166744	13.52979573	13.71672458	14.027907	14.62482705	15.44042439	16.49801329	17.21688072	17.7900437	18.81872078	19.64710224
80–80.99 months	−3.326345795	15.45287581	0.088942897	13.52845994	13.71637124	14.02935081	14.63032238	15.45287581	16.52228624	17.25125697	17.83382275	18.88272474	19.7308886
81–81.99 months	−3.328602731	15.46636218	0.089728202	13.5276813	13.71663233	14.03149952	14.63667844	15.46636218	16.54775649	17.28690708	17.87892434	18.948137	19.81618799
82–82.99 months	−3.328725277	15.48086704	0.090521875	13.52746565	13.71751078	14.03435159	14.64388639	15.48086704	16.57440029	17.32380254	17.9253152	19.01491107	19.902936
83–83.99 months	−3.32687018	15.49637465	0.091323162	13.52781794	13.71900887	14.03790521	14.65193763	15.49637465	16.6021948	17.3619157	17.97296286	19.08300081	19.99106797
84–84.99 months	−3.323188896	15.51286936	0.092131305	13.52874305	13.72112886	14.0421586	14.66082372	15.51286936	16.6311172	17.40121891	18.02183493	19.15236073	20.08052042
85–85.99 months	−3.317827016	15.53033563	0.092945544	13.53024568	13.72387293	14.04710998	14.67053629	15.53033563	16.66114466	17.44168456	18.07189919	19.22294589	20.17123104
86–86.99 months	−3.310923871	15.54875807	0.093765118	13.53233036	13.72724315	14.05275762	14.68106712	15.54875807	16.69225445	17.48328513	18.12312353	19.29471191	20.2631386
87–87.99 months	−3.302612272	15.56812143	0.09458927	13.53500147	13.7312415	14.05909975	14.69240809	15.56812143	16.72442396	17.52599317	18.17547605	19.36761493	20.35618297
88–88.99 months	−3.293018361	15.58841065	0.095417247	13.53826314	13.73586983	14.06613458	14.7045512	15.58841065	16.7576307	17.56978138	18.22892501	19.44161165	20.45030507
89–89.99 months	−3.282260813	15.60961101	0.096248301	13.54211938	13.7411299	14.0738604	14.71748869	15.60961101	16.79185246	17.61462266	18.28343882	19.51665894	20.54544624
90–90.99 months	−3.270454609	15.63170735	0.097081694	13.54657375	13.74702309	14.08227508	14.73121238	15.63170735	16.82706672	17.66048985	18.33898626	19.59271539	20.64155132
91–91.99 months	−3.257703616	15.65468563	0.097916698	13.55162988	13.753551	14.091377	14.74571498	15.65468563	16.86325188	17.70735632	18.39553611	19.6697383	20.73856241
92–92.99 months	−3.244108214	15.67853139	0.098752593	13.55729098	13.7607148	14.10116411	14.76098876	15.67853139	16.90038609	17.75519541	18.45305756	19.74768666	20.83642509
93–93.99 months	−3.229761713	15.70323052	0.099588675	13.56356006	13.76851558	14.1116344	14.77702622	15.70323052	16.9384478	17.80398077	18.51151998	19.82651963	20.93508525
94–94.99 months	−3.214751287	15.72876911	0.100424251	13.57043987	13.77695423	14.12278578	14.79381994	15.72876911	16.97741575	17.85368626	18.57089304	19.90619689	21.03448975
95–95.99 months	−3.199158184	15.75513347	0.101258643	13.57793291	13.78603145	14.13461608	14.81136258	15.75513347	17.01726889	17.90428602	18.63114669	19.98667859	21.13458634
96–96.99 months	−3.18305795	15.78231007	0.102091189	13.58604144	13.79574779	14.14712305	14.82964685	15.78231007	17.05798645	17.95575444	18.69225117	20.06792538	21.2353237
97–97.99 months	−3.166520664	15.8102856	0.102921245	13.59476742	13.80610355	14.16030433	14.84866554	15.8102856	17.09954792	18.00806622	18.75417705	20.1498984	21.33665138
98–98.99 months	−3.1496103	15.83904708	0.103748189	13.60411246	13.81709878	14.17415743	14.86841153	15.83904708	17.14193325	18.06119653	18.81689537	20.23255928	21.4385195
99–99.99 months	−3.132389637	15.86858123	0.104571386	13.61407844	13.82873375	14.18867999	14.88887764	15.86858123	17.18512191	18.1151201	18.8803769	20.31587026	21.54088032
100–100.99 months	−3.114911153	15.89887562	0.105390269	13.62466611	13.84100784	14.20386916	14.91005687	15.89887562	17.22909475	18.16981303	18.94459357	20.39979379	21.64368493
101–101.99 months	−3.097226399	15.92991765	0.106204258	13.63587653	13.85392068	14.21972223	14.93194218	15.92991765	17.2738323	18.22525119	19.00951733	20.48429323	21.74688677
102–102.99 months	−3.079383079	15.96169481	0.107012788	13.64771054	13.86747174	14.23623642	14.95452659	15.96169481	17.31931519	18.28141055	19.07512019	20.56933216	21.85043987
103–103.99 months	−3.061423765	15.99419489	0.107815327	13.66016853	13.88166013	14.25340873	14.97780313	15.99419489	17.36552463	18.33826774	19.14137485	20.6548748	21.95429887
104–104.99 months	−3.043386071	16.02740607	0.108611374	13.67325038	13.89648454	14.27123591	15.00176488	16.02740607	17.4124424	18.39579999	19.20825462	20.74088584	22.05841878
105–105.99 months	−3.025310003	16.0613159	0.109400388	13.68695684	13.91194439	14.28971516	15.02640489	16.0613159	17.46004925	18.45398355	19.27573205	20.82733059	22.16275742
106–106.99 months	−3.007225737	16.09591292	0.110181915	13.70128712	13.92803786	14.30884292	15.05171626	16.09591292	17.50832768	18.51279647	19.34378135	20.9141748	22.26727123
107–107.99 months	−2.989164598	16.13118532	0.110955478	13.71624103	13.94476358	14.32861592	15.07769209	16.13118532	17.55725951	18.57221621	19.41237631	21.00138483	22.37191887
108–108.99 months	−2.971148225	16.16712234	0.111720691	13.73181676	13.9621189	14.3490301	15.10432556	16.16712234	17.60682848	18.63222223	19.48149248	21.08892746	22.47665729
109–109.99 months	−2.953208047	16.20371168	0.112477059	13.7480147	13.98010297	14.37008248	15.13160968	16.20371168	17.65701563	18.69279128	19.55110329	21.17677023	22.58144893
110–110.99 months	−2.935363951	16.24094239	0.1132242	13.76483325	13.99871328	14.39176909	15.15953759	16.24094239	17.70780444	18.75390266	19.62118443	21.26488107	22.68625363
111–111.99 months	−2.917635157	16.27880346	0.113961734	13.78227084	14.01794738	14.41408598	15.1881024	16.27880346	17.75917825	18.81553565	19.69171163	21.3532285	22.79103265
112–112.99 months	−2.900039803	16.31728385	0.114689291	13.80032593	14.03780282	14.43702918	15.21729722	16.31728385	17.81112044	18.87766958	19.76266083	21.44178165	22.89574847
113–113.99 months	−2.882593796	16.35637267	0.115406523	13.81899666	14.0582769	14.46059456	15.2471151	16.35637267	17.86361469	18.94028419	19.83400841	21.53051015	23.00036429
114–114.99 months	−2.865311266	16.39605916	0.116113097	13.83828098	14.07936677	14.48477791	15.27754914	16.39605916	17.91664493	19.00335954	19.90573115	21.61938426	23.10484416
115–115.99 months	−2.848204697	16.43633265	0.116808702	13.85817663	14.10106937	14.50957485	15.30859238	16.43633265	17.97019532	19.06687603	19.97780623	21.70837477	23.20915296
116–116.99 months	−2.831285052	16.47718256	0.117493042	13.87868113	14.1233815	14.53498094	15.34023785	16.47718256	18.02425026	19.13081436	20.05021121	21.79745308	23.31325641
117–117.99 months	−2.81456189	16.51859843	0.11816584	13.8997918	14.14629977	14.56099157	15.37247856	16.51859843	18.0787944	19.19515554	20.12292406	21.88659115	23.41712109
118–118.99 months	−2.79804347	16.56056987	0.118826835	13.92150576	14.16982063	14.58760204	15.40530752	16.56056987	18.13381258	19.25988094	20.19592313	21.97576153	23.5207144
119–119.99 months	−2.781736856	16.60308661	0.119475785	13.94381995	14.19394037	14.61480754	15.43871766	16.60308661	18.1892899	19.3249722	20.26918717	22.06493737	23.62400462
120–120.99 months	−2.765648008	16.64613844	0.120112464	13.96673109	14.21865508	14.64260311	15.47270195	16.64613844	18.24521166	19.3904113	20.34269534	22.15409238	23.72696086
121–121.99 months	−2.749782197	16.68971518	0.120736656	13.99023581	14.24396081	14.67098376	15.50725326	16.68971518	18.3015633	19.45618042	20.41642709	22.24320091	23.82955322

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys—Con.													
122–122.99 months	−2.734142443	16.73380695	0.121348181	14.01433021	14.26985313	14.6999442	15.5423645	16.73380695	18.35833084	19.52226247	20.49036263	22.33223786	23.93175206
123–123.99 months	−2.718732873	16.77840363	0.121946849	14.0390107	14.29632789	14.72947925	15.57802849	16.77840363	18.41549995	19.58864006	20.56448202	22.42117875	24.0335295
124–124.99 months	−2.703555506	16.82349538	0.122532501	14.06427317	14.32338048	14.75958347	15.61423805	16.82349538	18.4730569	19.65529649	20.63876611	22.5099997	24.1348579
125–125.99 months	−2.688611957	16.86907238	0.123104991	14.09011344	14.35100623	14.79025137	15.65098595	16.86907238	18.53098805	19.72221531	20.71319602	22.59867744	24.23571063
126–126.99 months	−2.673903164	16.91512487	0.123664186	14.11652711	14.37920031	14.8214773	15.68826493	16.91512487	18.58928	19.78938034	20.78775327	22.68718928	24.33606191
127–127.99 months	−2.659429443	16.96164317	0.124209969	14.14350962	14.40795771	14.85325552	15.72606768	16.96164317	18.64791953	19.85677572	20.86241981	22.77551316	24.43588681
128–128.99 months	−2.645190534	17.00861766	0.124742239	14.17105623	14.43727329	14.88558018	15.76438688	17.00861766	18.70689364	19.92438591	20.93717795	22.86362762	24.53516127
129–129.99 months	−2.631185649	17.05603879	0.125260905	14.19916203	14.46714175	14.91844531	15.80321513	17.05603879	18.76618951	19.99219565	21.01201043	22.95151182	24.63386207
130–130.99 months	−2.617413511	17.10389705	0.125765895	14.22782193	14.49755765	14.95184482	15.84254502	17.10389705	18.82579454	20.06019002	21.08690037	23.03914551	24.73196683
131–131.99 months	−2.603872392	17.15218302	0.126257147	14.25703066	14.52851537	14.98577251	15.8823691	17.15218302	18.88569633	20.12835437	21.1618313	23.12650908	24.82945404
132–132.99 months	−2.590560148	17.20088732	0.126734613	14.28678279	14.56000917	15.02022206	15.92267985	17.20088732	18.94588267	20.19667437	21.23678716	23.21358351	24.92630305
133–133.99 months	−2.577474253	17.25000062	0.12719826	14.31707271	14.59203313	15.05518706	15.96346973	17.25000062	19.00634155	20.265136	21.31175226	23.30035043	25.02249405
134–134.99 months	−2.564611831	17.29951367	0.127648067	14.34789463	14.62458122	15.09066095	16.00473115	17.29951367	19.06706116	20.33372554	21.38671134	23.38679204	25.11800807
135–135.99 months	−2.551969684	17.34941726	0.128084023	14.37924262	14.65764722	15.1266371	16.04645648	17.34941726	19.12802987	20.40242956	21.46164953	23.4728912	25.21282703
136–136.99 months	−2.539539972	17.39970308	0.128506192	14.41110933	14.69122381	15.16310811	16.08863812	17.39970308	19.18923776	20.4712365	21.53655365	23.55863129	25.3069313
137–137.99 months	−2.527325681	17.45036072	0.128914497	14.44349038	14.72530601	15.20006805	16.13126821	17.45036072	19.25067129	20.54013114	21.61140764	23.64399652	25.40030815
138–138.99 months	−2.515320235	17.50138161	0.129309001	14.47637861	14.75988661	15.23750958	16.17433905	17.50138161	19.31232029	20.60910189	21.6861986	23.72897155	25.49294066
139–139.99 months	−2.503519447	17.55275674	0.129689741	14.50976741	14.79495883	15.27542561	16.21784281	17.55275674	19.37417388	20.6781365	21.76091323	23.81354171	25.58481418
140–140.99 months	−2.491918934	17.60447714	0.130056765	14.54365005	14.83051578	15.31380892	16.26177162	17.60447714	19.43622137	20.74722303	21.83553865	23.89769296	25.67591492
141–141.99 months	−2.480514136	17.6565339	0.130410133	14.57801961	14.86655039	15.3526522	16.30611758	17.6565339	19.49845226	20.81634983	21.91006237	23.98141187	25.76622996
142–142.99 months	−2.469300331	17.70891811	0.130749913	14.61286903	14.90305549	15.39194804	16.35087272	17.70891811	19.5608562	20.88550554	21.98447229	24.06468566	25.85574725
143–143.99 months	−2.458272656	17.76162094	0.131076187	14.6481911	14.94002374	15.43168891	16.39602903	17.76162094	19.62342306	20.95467909	22.05875672	24.14750216	25.94445561
144–144.99 months	−2.447426113	17.81463359	0.131389042	14.68397844	14.97744768	15.47186716	16.44157847	17.81463359	19.68614286	21.02385969	22.13290433	24.22984982	26.0323447
145–145.99 months	−2.436755595	17.86794729	0.131688579	14.72022354	15.01531973	15.51247506	16.48751291	17.86794729	19.74900579	21.09303687	22.20690421	24.31171774	26.11940509
146–146.99 months	−2.426255887	17.92155332	0.131974905	14.75691872	15.05363215	15.55350476	16.53382421	17.92155332	19.81200224	21.1622004	22.28074585	24.39309562	26.20562819
147–147.99 months	−2.415921689	17.97544299	0.132248138	14.79405616	15.09237707	15.5949483	16.58050415	17.97544299	19.87512275	21.23134038	22.35441912	24.47397382	26.2910063
148–148.99 months	−2.405747619	18.02960765	0.132508403	14.83162791	15.13154651	15.63679762	16.62754449	18.02960765	19.93835804	21.30044717	22.42791427	24.55434332	26.37553258
149–149.99 months	−2.395728233	18.08403868	0.132755834	14.86962583	15.17113234	15.67904455	16.67493692	18.08403868	20.001699	21.36951141	22.50122197	24.63419572	26.45920106
150–150.99 months	−2.385858029	18.1387275	0.132990575	14.90804168	15.2111263	15.72168083	16.72267307	18.1387275	20.06513669	21.43852405	22.57433325	24.71352325	26.54200665
151–151.99 months	−2.376131459	18.19366555	0.133212776	14.94686707	15.25152001	15.76469808	16.77074454	18.19366555	20.12866232	21.5074763	22.64723955	24.79231881	26.62394515
152–152.99 months	−2.366542942	18.24884431	0.133422595	14.98609343	15.29230496	15.80808782	16.81914286	18.24884431	20.1922673	21.57635964	22.7199327	24.87057587	26.7050132
153–153.99 months	−2.357086871	18.3042553	0.133620197	15.0257121	15.33347251	15.85184148	16.86785954	18.3042553	20.25594317	21.64516586	22.79240491	24.9482886	26.78520835
154–154.99 months	−2.347757625	18.35989003	0.133805756	15.06571426	15.37501389	15.89595038	16.91688599	18.35989003	20.31968165	21.71388701	22.86464879	25.02545175	26.86452902
155–155.99 months	−2.338549576	18.41574009	0.133979452	15.10609095	15.41692023	15.94040572	16.96621361	18.41574009	20.38347461	21.78251541	22.93665733	25.10206075	26.94297451
156–156.99 months	−2.3294571	18.47179706	0.13414147	15.14683307	15.4591825	15.98519864	17.01583373	18.47179706	20.44731409	21.85104367	23.0084239	25.17811163	27.02054498
157–157.99 months	−2.320474586	18.52805255	0.134292005	15.1879314	15.50179159	16.03032014	17.06573761	18.52805255	20.51119228	21.91946467	23.07994228	25.25360108	27.09724149
158–158.99 months	−2.311596446	18.5844982	0.134431256	15.22937658	15.54473823	16.07576115	17.11591649	18.5844982	20.57510153	21.98777156	23.15120662	25.32852641	27.173066
159–159.99 months	−2.302817124	18.64112567	0.134559427	15.27115913	15.58801305	16.12151248	17.16636153	18.64112567	20.63903434	22.05595776	23.22221145	25.4028856	27.24802132
160–160.99 months	−2.294131107	18.69792663	0.134676731	15.31326943	15.63160658	16.16756484	17.21706384	18.69792663	20.70298336	22.12401698	23.2929517	25.47667722	27.32211115
161–161.99 months	−2.285532933	18.75489278	0.134783385	15.35569774	15.67550919	16.21390888	17.26801449	18.75489278	20.76694139	22.19194317	23.36342268	25.54990054	27.39534011
162–162.99 months	−2.277017201	18.81201584	0.134879611	15.39843418	15.71971118	16.2605351	17.31920447	18.81201584	20.83090139	22.25973057	23.43362008	25.62255542	27.46771366
163–163.99 months	−2.268578584	18.86928753	0.134965637	15.44146877	15.7642027	16.30743394	17.37062472	18.86928753	20.89485646	22.32737368	23.50353999	25.6946424	27.53923819
164–164.99 months	−2.260211837	18.92669959	0.135041695	15.48479139	15.80897382	16.35459573	17.42226614	18.92669959	20.95879983	22.39486727	23.57317887	25.76616263	27.60992094
165–165.99 months	−2.251911809	18.98424378	0.135108024	15.52839182	15.85401448	16.40201071	17.47411956	18.98424378	21.02272489	22.46220636	23.64253356	25.83711794	27.67977007
166–166.99 months	−2.243673453	19.04191185	0.135164867	15.57225971	15.89931451	16.44966902	17.52617573	19.04191185	21.08662518	22.52938625	23.71160129	25.90751079	27.74879463
167–167.99 months	−2.235491842	19.09969557	0.135212469	15.6163846	15.94486363	16.49756071	17.57842539	19.09969557	21.15049434	22.5964025	23.78037969	25.97734428	27.81700453
168–168.99 months	−2.227362173	19.15758672	0.135251083	15.66075591	15.99065148	16.54567574	17.63085916	19.15758672	21.21432619	22.66325092	23.84886673	26.04662217	27.88441062
169–169.99 months	−2.21927979	19.21557707	0.135280963	15.70536296	16.03666757	16.59400398	17.68346764	19.21557707	21.27811465	22.7299276	23.91706081	26.11534887	27.95102462
170–170.99 months	−2.211240187	19.27365839	0.135302371	15.75019496	16.0829013	16.64253518	17.73624136	19.27365839	21.34185379	22.79642886	23.98496068	26.18352944	28.01685913

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile									
				3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys—Con.													
171–171.99 months	−2.203239029	19.33182247	0.135315568	15.79524102	16.129342	16.69125904	17.78917078	19.33182247	21.40553781	22.86275131	24.05256549	26.25116959	28.08192768
172–172.99 months	−2.195272161	19.39006106	0.135320824	15.84049013	16.17597888	16.74016514	17.84224628	19.39006106	21.46916104	22.92889179	24.11987476	26.31827569	28.14624467
173–173.99 months	−2.187335625	19.44836594	0.135318407	15.8859312	16.22280106	16.78924297	17.8954582	19.44836594	21.53271791	22.99484741	24.18688841	26.38485476	28.20982542
174–174.99 months	−2.179425674	19.50672885	0.135308594	15.93155303	16.26979755	16.83848195	17.9487968	19.50672885	21.596203	23.06061552	24.25360674	26.45091448	28.27268613
175–175.99 months	−2.171538789	19.56514153	0.135291662	15.97734432	16.31695728	16.8878714	18.00225228	19.56514153	21.659611	23.12619375	24.3200304	26.51646321	28.33484391
176–176.99 months	−2.163671689	19.62359571	0.135267891	16.02329371	16.3642691	16.93740054	18.05581474	19.62359571	21.72293673	23.19157996	24.38616048	26.58150994	28.39631678
177–177.99 months	−2.155821357	19.6820831	0.135237567	16.0693897	16.41172173	16.98705851	18.10947424	19.6820831	21.78617511	23.25677226	24.4519984	26.64606434	28.45712363
178–178.99 months	−2.147985046	19.74059538	0.135200976	16.11562074	16.45930384	17.03683437	18.16322076	19.74059538	21.84932117	23.32176902	24.517546	26.71013675	28.51728428
179–179.99 months	−2.140160305	19.7991242	0.135158409	16.1619752	16.50700399	17.08671707	18.21704418	19.7991242	21.91237008	23.38656886	24.5828055	26.77373817	28.57681946
180–180.99 months	−2.132344989	19.85766121	0.135110159	16.20844134	16.55481067	17.13669551	18.27093434	19.85766121	21.97531708	23.45117065	24.64777949	26.83688026	28.63575076
181–181.99 months	−2.124537282	19.916198	0.135056522	16.25500735	16.60271228	17.18675845	18.32488097	19.916198	22.03815755	23.5155735	24.71247097	26.89957537	28.69410072
182–182.99 months	−2.116735712	19.97472615	0.134997797	16.30166137	16.65069714	17.23689462	18.37887373	19.97472615	22.10088696	23.57977678	24.77688329	26.96183652	28.75189275
183–183.99 months	−2.108939167	20.03323719	0.134934285	16.34839144	16.69875348	17.28709261	18.4329022	20.03323719	22.16350089	23.6437801	24.84102024	27.02367739	28.80915118
184–184.99 months	−2.10114692	20.09172262	0.134866291	16.39518554	16.74686947	17.33734097	18.48695587	20.09172262	22.22599501	23.70758332	24.90488595	27.08511234	28.86590125
185–185.99 months	−2.093358637	20.15017387	0.134794121	16.44203157	16.79503318	17.38762812	18.54102414	20.15017387	22.2883651	23.77118654	24.96848498	27.14615643	28.92216908
186–186.99 months	−2.085574403	20.20858236	0.134718085	16.4889174	16.84323264	17.43794242	18.59509632	20.20858236	22.35060703	23.83459013	25.03182226	27.20682538	28.97798172
187–187.99 months	−2.077794735	20.26693944	0.134638494	16.53583079	16.89145577	17.48827215	18.64916164	20.26693944	22.41271676	23.89779468	25.09490311	27.2671356	29.03336709
188–188.99 months	−2.070020599	20.32523642	0.134555663	16.58275947	16.93969043	17.53860547	18.70320922	20.32523642	22.47469037	23.96080104	25.15773327	27.32710417	29.08835404
189–189.99 months	−2.062253431	20.38346455	0.13446991	16.62969112	16.98792443	17.58893048	18.7572281	20.38346455	22.53652401	24.02361032	25.22031884	27.38674888	29.14297232
190–190.99 months	−2.054495145	20.44161501	0.134381553	16.67661334	17.03614547	17.63923518	18.8112072	20.44161501	22.59821392	24.08622386	25.28266636	27.4460882	29.19725256
191–191.99 months	−2.046748156	20.49967894	0.134290916	16.72351369	17.08434122	17.68950749	18.86513537	20.49967894	22.65975645	24.14864327	25.34478272	27.50514126	29.25122631
192–192.99 months	−2.039015385	20.5576474	0.134198323	16.77037969	17.13249925	17.73973524	18.91900132	20.5576474	22.72114803	24.21087038	25.40667527	27.56392793	29.30492601
193–193.99 months	−2.031300282	20.6155114	0.134104101	16.81719878	17.18060709	17.78990616	18.97279368	20.6155114	22.78238517	24.2729073	25.46835171	27.62246873	29.35838499
194–194.99 months	−2.023606828	20.67326189	0.134008581	16.86395838	17.22865219	17.8400079	19.02650098	20.67326189	22.84346448	24.33475639	25.52982017	27.68078489	29.41163748
195–195.99 months	−2.015942013	20.73088905	0.133912066	16.91064668	17.27662259	17.89002837	19.08011149	20.73088905	22.90438167	24.39641931	25.59108848	27.73889854	29.46472007
196–196.99 months	−2.008305745	20.7883851	0.133814954	16.95724926	17.32450423	17.93995429	19.13361379	20.7883851	22.96513563	24.4579009	25.65216707	27.79683185	29.51766572
197–197.99 months	−2.000706389	20.84574003	0.133717552	17.0037543	17.37228509	17.98977343	19.18699593	20.84574003	23.02572213	24.51920324	25.71306451	27.85460837	29.57051295
198–198.99 months	−1.993150137	20.90294449	0.1336202	17.05014902	17.41995236	18.03947307	19.24024598	20.90294449	23.08613815	24.58032971	25.77379055	27.91225209	29.62329955
199–199.99 months	−1.985643741	20.95998909	0.133523244	17.09642062	17.46749315	18.0890404	19.29335192	20.95998909	23.14638076	24.64128395	25.83435539	27.96978771	29.67606419
200–200.99 months	−1.97819451	21.01686433	0.133427032	17.1425562	17.51489451	18.1384625	19.34630158	21.01686433	23.20644712	24.70206989	25.89476963	28.02724061	29.72884644
201–201.99 months	−1.970810308	21.07356067	0.133331914	17.18854287	17.56214342	18.18772638	19.39908272	21.07356067	23.26633451	24.76269168	25.95504426	28.08463689	29.78168674
202–202.99 months	−1.96349954	21.1300685	0.133238245	17.23436764	17.60922679	18.23681892	19.45168294	21.1300685	23.3260403	24.82315378	26.01519074	28.1420033	29.83462638
203–203.99 months	−1.956271141	21.18637813	0.133146383	17.2800175	17.65613146	18.28572693	19.50408975	21.18637813	23.38556196	24.88346091	26.07522093	28.19936732	29.88770757
204–204.99 months	−1.949134561	21.24247982	0.13305669	17.32547937	17.70284417	18.3344371	19.55629056	21.24247982	23.44489706	24.94361805	26.13514709	28.25675709	29.94097335
205–205.99 months	−1.942099744	21.29836376	0.132969531	17.37074012	17.74935161	18.38293604	19.60827264	21.29836376	23.50404332	25.00363048	26.19498193	28.31420146	29.99446764
206–206.99 months	−1.935177101	21.35402009	0.132885274	17.41578654	17.79564039	18.43121023	19.66002316	21.35402009	23.56299853	25.06350375	26.2547386	28.37172995	30.04823522
207–207.99 months	−1.92837748	21.40943891	0.132804292	17.46060537	17.84169701	18.47924607	19.71152919	21.40943891	23.62176064	25.1232437	26.31443063	28.42937274	30.10232173
208–208.99 months	−1.921712136	21.46461026	0.132726962	17.50518327	17.8875079	18.52702984	19.76277767	21.46461026	23.68032771	25.18285645	26.37407203	28.48716074	30.15677367
209–209.99 months	−1.915192685	21.51952414	0.132653664	17.54950683	17.9330594	18.57454772	19.81375546	21.51952414	23.73869794	25.24234842	26.4336772	28.54512548	30.21163837
210–210.99 months	−1.908831065	21.57417053	0.132584784	17.59356252	17.97833773	18.62178578	19.8644493	21.57417053	23.79686967	25.30172632	26.49326098	28.60329919	30.26696403
211–211.99 months	−1.902639482	21.62853937	0.132520711	17.63733676	18.02332903	18.66872998	19.91484586	21.62853937	23.85484139	25.36099716	26.55283865	28.66171476	30.32279966
212–212.99 months	−1.896630358	21.68262062	0.132461838	17.68081585	18.06801933	18.71536617	19.96493169	21.68262062	23.91261174	25.42016826	26.6124259	28.72040572	30.37919514
213–213.99 months	−1.890816268	21.73640419	0.132408563	17.72398595	18.11239453	18.76168008	20.01469327	21.73640419	23.97017953	25.47924723	26.67203887	28.77940629	30.43620115
214–214.99 months	−1.885209876	21.78988003	0.132361289	17.76683315	18.15644042	18.80765734	20.06411699	21.78988003	24.02754374	25.538242	26.73169411	28.8387513	30.49386923
215–215.99 months	−1.879823505	21.84303819	0.132320427	17.80934323	18.20014256	18.8532834	20.11318921	21.84303819	24.08470367	25.59716095	26.79140871	28.89847621	30.55225152
216–216.99 months	−1.874670324	21.8958685	0.132286382	17.85150219	18.24348662	18.89854373	20.16189615	21.8958685	24.14165845	25.65601244	26.85119991	28.9586172	30.61140148
217–217.99 months	−1.869760299	21.94836168	0.1322596	17.89329472	18.28645727	18.94342321	20.21022414	21.94836168	24.19840866	25.71480629	26.91108626	29.0192108	30.67137176
218–218.99 months	−1.865113245	22.00050569	0.132240418	17.93470899	18.32904183	18.98790813	20.25815885	22.00050569	24.25495098	25.77354888	26.97108394	29.08029503	30.73222122
219–219.99 months	−1.860734944	22.05229242	0.13222933	17.97572809	18.37122369	19.03198262	20.3056868	22.05229242	24.31128792	25.83225207	27.03121333	29.14190734	30.79400211

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Boys—Con.													
220–220.99 months	−1.85663384	22.10371305	0.132226801	18.01633608	18.41298696	19.07563119	20.35279433	22.10371305	24.36742097	25.89092687	27.09149434	29.20408599	30.85676906
221–221.99 months	−1.852827186	22.15475603	0.132233201	18.05651989	18.45431794	19.11883943	20.39946695	22.15475603	24.42334799	25.94958116	27.15194482	29.26687079	30.92058278
222–222.99 months	−1.849323204	22.20541249	0.132248993	18.09626344	18.49520062	19.16159172	20.44569089	22.20541249	24.47907063	26.00822631	27.21258528	29.33030127	30.9855
223–223.99 months	−1.846131607	22.255673	0.132274625	18.13555112	18.53561932	19.2038726	20.49145219	22.255673	24.53458985	26.06687321	27.27343608	29.39441777	31.05157949
224–224.99 months	−1.843261294	22.30552831	0.132310549	18.17436706	18.57555819	19.24566649	20.53673687	22.30552831	24.58990692	26.1255331	27.33451796	29.45926122	31.1188808
225–225.99 months	−1.840720248	22.3549693	0.132357221	18.21269512	18.61500111	19.28695764	20.581531	22.3549693	24.64502338	26.18421759	27.39585208	29.52487306	31.18746427
226–226.99 months	−1.83851544	22.40398706	0.132415103	18.25051886	18.65393178	19.32773023	20.62582066	22.40398706	24.69994107	26.24293861	27.45746001	29.59129532	31.25739102
227–227.99 months	−1.83665586	22.45257182	0.132484631	18.28782254	18.69233437	19.36796858	20.66959159	22.45257182	24.75466075	26.30170723	27.51936283	29.65857091	31.32872478
228–228.99 months	−1.835138046	22.50071778	0.132566359	18.3245866	18.73019025	19.40765581	20.71283095	22.50071778	24.80918852	26.36053932	27.58158516	29.72674204	31.40152344
229–229.99 months	−1.833972004	22.54841437	0.132660699	18.36079565	18.7674838	19.44677624	20.75552409	22.54841437	24.86352415	26.41944523	27.64414785	29.79585303	31.47585441
230–230.99 months	−1.833157751	22.59565422	0.132768153	18.39643137	18.80419732	19.48531336	20.79765756	22.59565422	24.91767166	26.47843912	27.70707459	29.86594782	31.55178078
231–231.99 months	−1.83269562	22.64242956	0.132889211	18.43147564	18.84031318	19.52325062	20.83921773	22.64242956	24.97163459	26.53753478	27.77038891	29.93707103	31.62936748
232–232.99 months	−1.832584342	22.68873292	0.133024368	18.46590991	18.87581348	19.56057136	20.88019106	22.68873292	25.02541685	26.59674639	27.83411475	30.00926778	31.7086802
233–233.99 months	−1.832820974	22.73455713	0.133174129	18.49971524	18.91067999	19.59725875	20.9205641	22.73455713	25.07902274	26.65608851	27.89827645	30.08258369	31.78978539
234–234.99 months	−1.833400825	22.7798953	0.133338999	18.53287228	18.9448942	19.63329582	20.96032349	22.7798953	25.13245693	26.71557609	27.96289869	30.15706484	31.87275025
235–235.99 months	−1.834317405	22.82474087	0.133519496	18.56536124	18.97843726	19.66866547	20.99945599	22.82474087	25.18572453	26.77522448	28.0280066	30.23275779	31.95764272
236–236.99 months	−1.83555752	22.86908912	0.133716192	18.59716016	19.0112887	19.70334974	21.03794885	22.86908912	25.23883315	26.83505132	28.09362697	30.30970901	32.04452853
237–237.99 months	−1.837119466	22.91293151	0.133929525	18.62825142	19.04343134	19.7373324	21.07578835	22.91293151	25.29178502	26.89506944	28.15978336	30.387967	32.13348232
238–238.99 months	−1.838987063	22.95626373	0.134160073	18.65861245	19.07484425	19.7705953	21.11296191	22.95626373	25.34458825	26.95529697	28.22650313	30.46757924	32.22457182
239–239.99 months	−1.841146139	22.99908062	0.134408381	18.68822161	19.10550722	19.80312068	21.14945673	22.99908062	25.39724967	27.01575092	28.29381294	30.54859414	32.31786791
Girls													
24–24.99 months	−1.024496827	16.38804056	0.085025838	14.13226271	14.3801866	14.77964811	15.49975639	16.38804056	17.38581552	17.97371413	18.39526372	19.05823845	19.51534333
25–25.99 months	−1.102698353	16.3189719	0.084214052	14.10240814	14.34527262	14.73694628	15.44421901	16.3189719	17.30484811	17.88748812	18.30610782	18.9659499	19.42197989
26–26.99 months	−1.18396635	16.25207985	0.083455124	14.07297394	14.31096806	14.6951581	15.39014846	16.25207985	17.2269319	17.80489051	18.22103253	18.87853388	19.33410382
27–27.99 months	−1.268071036	16.18734669	0.082748284	14.04396337	14.27727686	14.65428696	15.33754218	16.18734669	17.15202498	17.72586396	18.13997016	18.79590999	19.25163039
28–28.99 months	−1.354751525	16.12475448	0.082092737	14.01538008	14.24420303	14.61433601	15.28639717	16.12475448	17.08008556	17.65035137	18.06285334	18.71799839	19.17447582
29–29.99 months	−1.443689692	16.06428762	0.081487717	13.98722569	14.21174909	14.57530775	15.23671134	16.06428762	17.01107457	17.57829774	17.98961595	18.64471845	19.10255392
30–30.99 months	−1.53454192	16.00593001	0.080932448	13.95950246	14.17991775	14.53720437	15.18848189	16.00593001	16.94495296	17.50964839	17.92019231	18.5759903	19.03577948
31–31.99 months	−1.626928093	15.94966631	0.080426175	13.93221207	14.14871111	14.50002752	15.14170598	15.94966631	16.88168308	17.44434994	17.85451773	18.51173402	18.97406651
32–32.99 months	−1.720434829	15.89548197	0.079968176	13.90535562	14.11813062	14.46377827	15.09638064	15.89548197	16.82122877	17.38235043	17.79252859	18.45186978	18.91732801
33–33.99 months	−1.814635262	15.84336179	0.079557735	13.87893492	14.08817793	14.42845728	15.05250203	15.84336179	16.763554	17.32359846	17.73416201	18.39631848	18.86547771
34–34.99 months	−1.909076262	15.79329146	0.079194187	13.852951	14.0588539	14.39406456	15.01006617	15.79329146	16.70862449	17.26804436	17.67935646	18.34500099	18.81842784
35–35.99 months	−2.003296102	15.7452564	0.078876895	13.82740517	14.03015932	14.36059959	14.96906838	15.7452564	16.65640663	17.21563951	17.62805146	18.29783876	18.7760905
36–36.99 months	−2.096828937	15.69924188	0.078605255	13.80229888	14.00209476	14.32806133	14.92950329	15.69924188	16.60686761	17.16633643	17.5801877	18.25475381	18.73837743
37–37.99 months	−2.189211877	15.65523282	0.078378696	13.77763382	13.97466073	14.29644823	14.89136478	15.65523282	16.55997523	17.12008872	17.53570705	18.21566879	18.70520011
38–38.99 months	−2.279991982	15.61321371	0.078196674	13.75341201	13.94785767	14.26575827	14.85464591	15.61321371	16.51569783	17.07685104	17.49455256	18.18050711	18.67646985
39–39.99 months	−2.368732949	15.57316843	0.078058667	13.72963586	13.92168608	14.23598902	14.81933896	15.57316843	16.4740041	17.03657894	17.45666842	18.14919304	18.65209796
40–40.99 months	−2.455021314	15.53508019	0.077964169	13.70630824	13.89614655	14.20713766	14.78543535	15.53508019	16.43486298	16.99922885	17.42199993	18.12165176	18.63199585
41–41.99 months	−2.538471972	15.49893145	0.077912684	13.68343254	13.87123981	14.17920105	14.75292568	15.49893145	16.39824347	16.96475788	17.39049347	18.09780945	18.61607518
42–42.99 months	−2.618732901	15.46470384	0.077903716	13.66101266	13.84696678	14.15217581	14.72179977	15.46470384	16.36411453	16.93312378	17.36209639	18.07759336	18.60424802
43–43.99 months	−2.695488973	15.43237817	0.077936763	13.63905306	13.82332865	14.12605833	14.69204668	15.43237817	16.33244497	16.90428477	17.33675699	18.06093184	18.59642696
44–44.99 months	−2.768464816	15.40193436	0.078011309	13.61755872	13.80032682	14.10084485	14.6636548	15.40193436	16.30320336	16.87819947	17.31442438	18.04775438	18.59252526
45–45.99 months	−2.837426693	15.37335154	0.078126817	13.59653518	13.77796299	14.07653151	14.63661186	15.37335154	16.27635793	16.85482681	17.29504843	18.03799161	18.59245694
46–46.99 months	−2.902178205	15.34660842	0.078282739	13.57598804	13.75623885	14.05311425	14.61090523	15.34660842	16.25187703	16.83412628	17.27857995	18.03157513	18.59613624
47–47.99 months	−2.962580386	15.32168181	0.078478449	13.55592455	13.73515717	14.03058936	14.58652134	15.32168181	16.22972719	16.81605638	17.2649696	18.02843822	18.6034803
48–48.99 months	−3.018521987	15.29854897	0.078713325	13.53635124	13.71472021	14.00895279	14.56344665	15.29854897	16.20987583	16.80057671	17.25416922	18.02851473	18.61440545
49–49.99 months	−3.069936555	15.27718618	0.078986694	13.51727537	13.6949307	13.98820066	14.54166718	15.27718618	16.19228952	16.78764654	17.24613088	18.03173977	18.62882971
50–50.99 months	−3.116795864	15.2575692	0.079297841	13.49870449	13.67579162	13.96832912	14.52116867	15.2575692	16.17693441	16.77722512	17.24080701	18.03804946	18.64667225

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Girls—Con.													
51–51.99 months	−3.159107331	15.23967338	0.079646006	13.48064637	13.65730608	13.94933441	14.50193674	15.23967338	16.16377626	16.76927159	17.23815034	18.04738091	18.66785338
52–52.99 months	−3.196911083	15.22347371	0.080030389	13.46310899	13.63947739	13.93121283	14.48395686	15.22347371	16.15278049	16.76374505	17.23811389	18.05967216	18.6922946
53–53.99 months	−3.230276759	15.20894491	0.080450145	13.44610041	13.62230894	13.91396079	14.46721445	15.20894491	16.14391221	16.76060449	17.24065086	18.0748621	18.71991859
54–54.99 months	−3.259300182	15.19606152	0.080904391	13.42962877	13.60580421	13.89757474	14.45169495	15.19606152	16.13713628	16.75980884	17.24571467	18.09289045	18.75064919
55–55.99 months	−3.284099963	15.18479799	0.081392203	13.41370222	13.58996673	13.88205123	14.4373838	15.18479799	16.13241736	16.76131695	17.25325891	18.11369768	18.78441142
56–56.99 months	−3.30481415	15.17512871	0.081912623	13.39832882	13.57480002	13.8673869	14.42426656	15.17512871	16.12971996	16.76508763	17.2632373	18.13722499	18.82113141
57–57.99 months	−3.321596954	15.16702811	0.082464661	13.38351658	13.56030761	13.8535784	14.41232886	15.16702811	16.12900854	16.77107966	17.27560372	18.16341422	18.86073644
58–58.99 months	−3.334615646	15.16047068	0.083047295	13.36927334	13.54649295	13.84062247	14.40155647	15.16047068	16.13024748	16.77925184	17.29031217	18.19220786	18.90315485
59–59.99 months	−3.344047622	15.15543107	0.083659478	13.35560679	13.53335941	13.82851587	14.39193532	15.15543107	16.13340121	16.78956298	17.30731682	18.22354893	18.94831604
60–60.99 months	−3.35007771	15.15188405	0.084300139	13.34252439	13.52091027	13.81725538	14.38345148	15.15188405	16.13843423	16.80197195	17.32657196	18.25738105	18.99615046
61–61.99 months	−3.352893805	15.14980479	0.0849682	13.33003322	13.50914853	13.80683773	14.37609125	15.14980479	16.14531133	16.81643792	17.34803218	18.29364826	19.04658918
62–62.99 months	−3.352691376	15.14916825	0.085662539	13.31814053	13.4980774	13.79725982	14.36984096	15.14916825	16.15399692	16.83291965	17.37165187	18.33229525	19.09956514
63–63.99 months	−3.34966438	15.14994984	0.086382035	13.3068531	13.48769977	13.78851848	14.3646872	15.14994984	16.16445581	16.85137625	17.39738575	18.37326713	19.15501183
64–64.99 months	−3.343998803	15.15212585	0.087125591	13.29617673	13.47801782	13.78061022	14.3606169	15.15212585	16.17665394	16.87176785	17.42518932	18.41650918	19.21286229
65–65.99 months	−3.335889574	15.15567186	0.087892047	13.28611805	13.4690344	13.77353197	14.35761687	15.15567186	16.19055603	16.89405345	17.45501735	18.46196754	19.27305261
66–66.99 months	−3.325522491	15.16056419	0.088680264	13.27668282	13.46075175	13.76728041	14.35567422	15.16056419	16.20612774	16.91819285	17.48682523	18.50958858	19.33551875
67–67.99 months	−3.31307846	15.16677947	0.089489106	13.26787651	13.45317191	13.76185216	14.35477623	15.16677947	16.22333502	16.94414613	17.52056863	18.55931907	19.40019747
68–68.99 months	−3.298732648	15.17429464	0.090317434	13.25970423	13.44629667	13.75724378	14.35491035	15.17429464	16.24214414	16.97187362	17.55620345	18.6111062	19.46702632
69–69.99 months	−3.282653831	15.18308694	0.091164117	13.25217076	13.44012761	13.75345175	14.35606415	15.18308694	16.26252167	17.00133593	17.5936859	18.6648976	19.53594365
70–70.99 months	−3.265003896	15.1931339	0.092028028	13.24528055	13.43466608	13.75047248	14.35822537	15.1931339	16.28443453	17.03249399	17.63297244	18.72064127	19.60688859
71–71.99 months	−3.245937506	15.20441335	0.092908048	13.23903773	13.42991321	13.74830229	14.36138186	15.20441335	16.30784995	17.065309	17.67401984	18.77828567	19.67980103
72–72.99 months	−3.225606516	15.21690296	0.093803033	13.23344678	13.42587042	13.74693776	14.36552155	15.21690296	16.33273474	17.09974172	17.7167845	18.83777954	19.75462234
73–73.99 months	−3.204146115	15.2305815	0.094711916	13.22851054	13.42253788	13.74637473	14.37063258	15.2305815	16.35905747	17.13575468	17.7612244	18.89907229	19.83129333
74–74.99 months	−3.181690237	15.24542745	0.095633595	13.22423251	13.41991629	13.74660941	14.37670312	15.24542745	16.38678602	17.17330968	17.80729692	18.96211354	19.90975644
75–75.99 months	−3.158363475	15.26141966	0.096566992	13.22061564	13.41800595	13.74763782	14.38372148	15.26141966	16.41588887	17.21236911	17.85496	19.02685341	19.9899546
76–76.99 months	−3.134282833	15.27853728	0.097511046	13.21766256	13.41680692	13.74945586	14.39167606	15.27853728	16.44633482	17.25289572	17.90417191	19.09324243	20.07183146
77–77.99 months	−3.109557879	15.29675967	0.09846471	13.21537563	13.41631905	13.75205934	14.40055533	15.29675967	16.478093	17.29485256	17.95489128	19.16123158	20.15533137
78–78.99 months	−3.084290931	15.31606644	0.099426955	13.2137569	13.41654198	13.75544399	14.41034784	15.31606644	16.51113288	17.33820304	18.00707707	19.23077228	20.24039941
79–79.99 months	−3.058577292	15.33643745	0.100396769	13.21280815	13.41747514	13.7596054	14.42104223	15.33643745	16.54542424	17.38291092	18.06068861	19.30181639	20.32698132
80–80.99 months	−3.032505499	15.35785274	0.101373159	13.21253087	13.41911775	13.76453911	14.43262719	15.35785274	16.58093719	17.42894029	18.11568557	19.37431624	20.41502357
81–81.99 months	−3.0061576	15.38029261	0.10235515	13.2129263	13.42146884	13.7702405	14.44509148	15.38029261	16.61764214	17.4762556	18.17202801	19.44822461	20.5044733
82–82.99 months	−2.979609448	15.40373754	0.103341788	13.21399541	13.42452722	13.77670491	14.4584239	15.40373754	16.65550982	17.52482162	18.22967635	19.52349477	20.59527834
83–83.99 months	−2.952930993	15.42816819	0.104332139	13.2157389	13.42829152	13.78392751	14.4726133	15.42816819	16.69451128	17.57460349	18.28859138	19.60008044	20.68738721
84–84.99 months	−2.926186592	15.45356545	0.105325289	13.21815723	13.43276016	13.79190343	14.48764859	15.45356545	16.73461785	17.6255667	18.34873428	19.67793583	20.7807491
85–85.99 months	−2.899435307	15.47991037	0.106320346	13.22125062	13.43793139	13.80062765	14.50351871	15.47991037	16.77580119	17.67767708	18.4100666	19.75701564	20.8753139
86–86.99 months	−2.872731211	15.50718419	0.10731644	13.22501902	13.44380325	13.81009508	14.52021262	15.50718419	16.81803321	17.7309008	18.47255029	19.83727506	20.97103216
87–87.99 months	−2.846123683	15.53536829	0.108312721	13.22946217	13.45037362	13.82030049	14.53771933	15.53536829	16.86128616	17.78520438	18.53614768	19.91866977	21.06785511
88–88.99 months	−2.819657704	15.56444426	0.109308364	13.23457958	13.45764018	13.83123858	14.55602787	15.56444426	16.90553254	17.8405547	18.60082149	20.00115598	21.16573466
89–89.99 months	−2.793374145	15.5943938	0.110302563	13.24037052	13.46560044	13.84290393	14.57512728	15.5943938	16.95074515	17.89691898	18.66653485	20.08469037	21.2646234
90–90.99 months	−2.767310047	15.6251988	0.111294537	13.24683405	13.47425174	13.85529103	14.59500664	15.6251988	16.99689705	17.95426475	18.73325124	20.16923016	21.3644746
91–91.99 months	−2.741498897	15.65684126	0.112283526	13.25396902	13.48359125	13.86839426	14.61565502	15.65684126	17.04396158	18.01255992	18.80093458	20.25473307	21.46524221
92–92.99 months	−2.715970894	15.68930333	0.113268793	13.26177409	13.49361598	13.8822079	14.63706153	15.68930333	17.09191233	18.07177271	18.86954915	20.34115737	21.56688088
93–93.99 months	−2.690753197	15.7225673	0.114249622	13.27024769	13.50432278	13.89672614	14.65921526	15.7225673	17.14072316	18.13187166	18.93905963	20.42846182	21.66934595
94–94.99 months	−2.665870146	15.75661555	0.115225321	13.27938808	13.51570835	13.91194308	14.68210532	15.75661555	17.19036814	18.19282565	19.00943108	20.51660573	21.77259347
95–95.99 months	−2.641343436	15.79143062	0.116195218	13.28919334	13.52776922	13.9278527	14.70572083	15.79143062	17.24082164	18.25460388	19.08062897	20.60554896	21.87658015
96–96.99 months	−2.617192204	15.82699517	0.117158667	13.2996613	13.54050176	13.9444489	14.7300509	15.82699517	17.29205828	18.31717594	19.15261918	20.69525186	21.98126336
97–97.99 months	−2.593430614	15.86329241	0.118115073	13.31078904	13.55390172	13.96172519	14.75508471	15.86329241	17.34405364	18.38051241	19.22536854	20.78567525	22.08660008
98–98.99 months	−2.570076037	15.90030484	0.119063807	13.32257456	13.56796556	13.97967549	14.78081132	15.90030484	17.39678222	18.44458291	19.29884326	20.87678068	22.19254999
99–99.99 months	−2.547141473	15.93801545	0.12000429	13.33501512	13.58268918	13.99829338	14.80721981	15.93801545	17.45021936	18.50935798	19.3730104	20.96853014	22.29907253

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Girls—Con.													
100–100.99 months	−2.524635245	15.97640787	0.120935994	13.34810726	13.59806788	14.01757212	14.83429943	15.97640787	17.50434149	18.57480931	19.44783809	21.06088607	22.4061266
101–101.99 months	−2.502569666	16.01546483	0.121858355	13.36184843	13.61409768	14.0375053	14.86203913	16.01546483	17.55912371	18.6409074	19.52329364	21.15381165	22.51367407
102–102.99 months	−2.48095189	16.05516984	0.12277087	13.37623516	13.63077388	14.05808613	14.89042805	16.05516984	17.61454239	18.70762408	19.59934557	21.24727049	22.62167597
103–103.99 months	−2.459785573	16.09550688	0.123673085	13.39126329	13.6480912	14.07930747	14.91945533	16.09550688	17.67057478	18.77493214	19.67596331	21.34122666	22.73009308
104–104.99 months	−2.439080117	16.13645881	0.124564484	13.40693007	13.6660455	14.1011628	14.94910996	16.13645881	17.72719638	18.84280276	19.75311515	21.43564505	22.8388898
105–105.99 months	−2.418838304	16.17800955	0.125444639	13.42323134	13.68463148	14.12364494	14.97938101	16.17800955	17.78438449	18.91120897	19.830771	21.5304909	22.94802887
106–106.99 months	−2.399063683	16.22014281	0.126313121	13.44016315	13.70384401	14.1467468	15.01025752	16.22014281	17.84211614	18.98012366	19.90890079	21.62573005	23.05747448
107–107.99 months	−2.379756861	16.26284277	0.127169545	13.45772088	13.72367745	14.17046092	15.04172856	16.26284277	17.9003692	19.04952063	19.98747533	21.72132885	23.16719057
108–108.99 months	−2.360920527	16.30609316	0.128013515	13.47590046	13.74412656	14.19478013	15.0737831	16.30609316	17.95912092	19.11937316	20.06646519	21.8172543	23.27714304
109–109.99 months	−2.342557728	16.34987759	0.128844639	13.49469797	13.7651862	14.21969726	15.10641007	16.34987759	18.01834843	19.18965453	20.14584104	21.91347402	23.38729906
110–110.99 months	−2.324663326	16.39418118	0.129662637	13.51410735	13.78684956	14.24520415	15.13959859	16.39418118	18.07803138	19.26034062	20.22557581	22.00995586	23.49762289
111–111.99 months	−2.307240716	16.43898741	0.130467138	13.53412476	13.80911155	14.27129365	15.17333749	16.43898741	18.13814687	19.33140487	20.30564061	22.10666864	23.60808381
112–112.99 months	−2.290287663	16.48428082	0.131257852	13.55474487	13.83196589	14.29795787	15.20761574	16.48428082	18.19867379	19.4028226	20.38600821	22.20358151	23.71864933
113–113.99 months	−2.273803847	16.53004554	0.132034479	13.5759628	13.85540667	14.32518913	15.24242219	16.53004554	18.25959047	19.47456869	20.46665117	22.30066429	23.82928884
114–114.99 months	−2.257782149	16.57626713	0.132796819	13.59777181	13.87942647	14.35297886	15.27774591	16.57626713	18.32087764	19.54662051	20.5475442	22.39788709	23.9399692
115–115.99 months	−2.242227723	16.62292864	0.133544525	13.62016849	13.90402053	14.38132004	15.31357557	16.62292864	18.38251202	19.6189515	20.628659	22.49522108	24.05066418
116–116.99 months	−2.227132805	16.67001572	0.134277436	13.64314567	13.92918106	14.4102038	15.34990008	16.67001572	18.44447472	19.69153965	20.70997108	22.59263755	24.16134214
117–117.99 months	−2.212495585	16.71751288	0.134995324	13.66669786	13.95490163	14.43962209	15.38670828	16.71751288	18.50674506	19.7643612	20.79145469	22.69010855	24.27197506
118–118.99 months	−2.19831275	16.76540496	0.135697996	13.69081905	13.98117536	14.46956659	15.42398894	16.76540496	18.56930296	19.83739314	20.87308482	22.78760665	24.38253502
119–119.99 months	−2.184580762	16.81367689	0.136385276	13.71550304	14.00799522	14.50002883	15.46173083	16.81367689	18.63212859	19.91061278	20.9548369	22.88510501	24.49299479
120–120.99 months	−2.171295888	16.86231366	0.137057004	13.7407435	14.03535405	14.5310003	15.49992271	16.86231366	18.69520235	19.98399779	21.03668675	22.98257733	24.60332779
121–121.99 months	−2.158454232	16.91130036	0.137713039	13.7665339	14.06324456	14.56247234	15.53855329	16.91130036	18.75850486	20.05752615	21.11861063	23.07999788	24.7135081
122–122.99 months	−2.146051754	16.96062216	0.138353254	13.79286758	14.0916593	14.59443621	15.57761127	16.96062216	18.82201698	20.13117619	21.20058521	23.17734149	24.8235105
123–123.99 months	−2.134084303	17.0102643	0.138977537	13.81973772	14.12059071	14.62688307	15.61708531	17.0102643	18.8857198	20.20492657	21.28258757	23.27458358	24.93331042
124–124.99 months	−2.122547629	17.06021213	0.139585795	13.84713731	14.15003106	14.65980398	15.65696405	17.06021213	18.94959465	20.27875629	21.36459523	23.3717001	25.04288396
125–125.99 months	−2.111437411	17.11045106	0.140177947	13.87505922	14.17997251	14.69318989	15.69723611	17.11045106	19.01362305	20.35264468	21.44658611	23.46866758	25.1522079
126–126.99 months	−2.100749266	17.16096656	0.140753927	13.90349614	14.21040706	14.72703166	15.73789008	17.16096656	19.07778681	20.42657139	21.52853856	23.56546313	25.26125968
127–127.99 months	−2.090478774	17.21174424	0.141313686	13.9324406	14.2413266	14.76132003	15.77891452	17.21174424	19.14206792	20.50051644	21.61043134	23.6620644	25.37001743
128–128.99 months	−2.080621484	17.26276973	0.141857186	13.96188497	14.27272286	14.79604567	15.82029796	17.26276973	19.20644863	20.57446015	21.69224364	23.7584496	25.47845992
129–129.99 months	−2.071172932	17.31402878	0.142384404	13.99182148	14.30458743	14.83119912	15.86202891	17.31402878	19.2709114	20.64838321	21.77395506	23.85459754	25.58656661
130–130.99 months	−2.062128649	17.3655072	0.142895332	14.02224218	14.33691178	14.86677084	15.90409584	17.3655072	19.33543894	20.72226661	21.85554562	23.95048756	25.69431763
131–131.99 months	−2.053484173	17.4171909	0.143389972	14.05313898	14.36968723	14.90275116	15.94648722	17.4171909	19.40001418	20.79609169	21.93699575	24.04609957	25.80169379
132–132.99 months	−2.045235058	17.46906585	0.143868341	14.0845036	14.40290497	14.93913036	15.98919146	17.46906585	19.46462028	20.86984014	22.01828633	24.14141407	25.90867656
133–133.99 months	−2.03737688	17.52111811	0.144330469	14.11632765	14.43655605	14.97589856	16.03219696	17.52111811	19.52924064	20.94349396	22.09939861	24.23641208	26.01524807
134–134.99 months	−2.029906684	17.57333347	0.144776372	14.14860307	14.47063181	15.01304607	16.07549205	17.57333347	19.59385826	21.01703489	22.18031382	24.33107526	26.12139201
135–135.99 months	−2.022817914	17.62569869	0.145206138	14.18132032	14.50512237	15.05056245	16.11906513	17.62569869	19.65845792	21.09044653	22.26101479	24.4253857	26.22709056
136–136.99 months	−2.016107084	17.67819987	0.145619819	14.21447084	14.54001862	15.08843769	16.1629045	17.67819987	19.72302336	21.16371155	22.34148377	24.51932616	26.33232837
137–137.99 months	−2.009769905	17.7308234	0.146017491	14.24804556	14.57531107	15.12666154	16.20699844	17.7308234	19.78753889	21.2368133	22.42170373	24.61287993	26.43709027
138–138.99 months	−2.003802134	17.78355575	0.146399239	14.28203528	14.61099007	15.16522362	16.25133521	17.78355575	19.85198907	21.30973548	22.50165801	24.70603086	26.54136175
139–139.99 months	−1.998199572	17.83638347	0.146765161	14.31643062	14.64704584	15.20411349	16.29590305	17.83638347	19.91635869	21.38246211	22.58133043	24.79876336	26.64512897
140–140.99 months	−1.992958064	17.88929321	0.147115364	14.35122206	14.68346846	15.24332057	16.34069017	17.88929321	19.98063276	21.45497756	22.66070517	24.89106241	26.74837878
141–141.99 months	−1.988073505	17.94227168	0.147449967	14.3863999	14.72024789	15.28283421	16.38568475	17.94227168	20.04479655	21.52726655	22.73976686	24.98291353	26.85109867
142–142.99 months	−1.983541835	17.9953057	0.147769097	14.42195429	14.75737391	15.32264362	16.43087493	17.9953057	20.10883554	21.5993141	22.81850056	25.07430281	26.95327681
143–143.99 months	−1.979359041	18.04838216	0.148072891	14.45787522	14.7948362	15.36273794	16.47624886	18.04838216	20.17273546	21.6711056	22.89689172	25.16521691	27.05490205
144–144.99 months	−1.975521156	18.10148804	0.148361495	14.4941525	14.83262428	15.40310619	16.52179463	18.10148804	20.23648228	21.74262677	22.97492622	25.25564304	27.15596389
145–145.99 months	−1.972024258	18.15461039	0.148635067	14.53077581	14.87072753	15.44373731	16.56750033	18.15461039	20.30006219	21.81386368	23.05259037	25.34556897	27.25645252
146–146.99 months	−1.968864465	18.20773639	0.148893769	14.56773463	14.90913518	15.4846201	16.61335399	18.20773639	20.36346164	21.88480271	23.12987089	25.43498301	27.35635878
147–147.99 months	−1.966037938	18.26085325	0.149137776	14.6050183	14.94783635	15.52574328	16.65934366	18.26085325	20.42666729	21.95543061	23.20675491	25.52387405	27.45567419

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	*L*	*M*	*S*	Percentile									
				3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Girls—Con.													
148–148.99 months	−1.963540872	18.31394832	0.14936727	14.64261599	14.98681999	15.56709547	16.70545732	18.31394832	20.48966607	22.02573445	23.28322999	25.61223153	27.55439092
149–149.99 months	−1.961369499	18.36700902	0.149582439	14.68051671	15.0260749	15.60866519	16.75168297	18.36700902	20.55244514	22.09570166	23.35928412	25.70004544	27.65250183
150–150.99 months	−1.959520079	18.42002284	0.149783482	14.7187093	15.06558978	15.65044083	16.79800855	18.42002284	20.61499187	22.16531999	23.43490568	25.78730634	27.75000043
151–151.99 months	−1.9579889	18.47297739	0.149970604	14.75718241	15.10535314	15.6924107	16.844422	18.47297739	20.67729392	22.23457754	23.51008349	25.87400532	27.8468809
152–152.99 months	−1.956772271	18.52586035	0.15014402	14.79592458	15.14535337	15.734563	16.89091121	18.52586035	20.73933915	22.30346276	23.58480678	25.96013405	27.9431381
153–153.99 months	−1.95586652	18.57865951	0.15030395	14.83492412	15.18557871	15.77688582	16.93746408	18.57865951	20.80111569	22.37196443	23.65906521	26.04568474	28.03876753
154–154.99 months	−1.955267984	18.63136275	0.150450621	14.87416922	15.22601726	15.81936717	16.98406846	18.63136275	20.86261191	22.44007167	23.73284885	26.13065016	28.13376538
155–155.99 months	−1.954973011	18.68395801	0.15058427	14.91364786	15.26665697	15.86199492	17.0307122	18.68395801	20.9238164	22.50777397	23.80614819	26.21502362	28.22812848
156–156.99 months	−1.954977947	18.73643338	0.150705138	14.95334789	15.30748565	15.90475685	17.07738309	18.73643338	20.98471803	22.57506113	23.87895414	26.298799	28.32185435
157–157.99 months	−1.955279136	18.788777	0.150813475	14.99325696	15.34849095	15.94764066	17.12406895	18.788777	21.04530589	22.6419233	23.95125804	26.38197072	28.41494115
158–158.99 months	−1.955872909	18.84097713	0.150909535	15.03336257	15.38966039	15.9906339	17.17075754	18.84097713	21.10556932	22.70835101	24.02305164	26.46453376	28.50738772
159–159.99 months	−1.956755579	18.89302212	0.150993582	15.07365202	15.43098133	16.03372404	17.21743662	18.89302212	21.16549792	22.77433508	24.0943271	26.54648363	28.59919355
160–160.99 months	−1.957923436	18.94490041	0.151065883	15.11411246	15.47244099	16.07689846	17.2640939	18.94490041	21.22508152	22.83986672	24.16507702	26.62781643	28.69035881
161–161.99 months	−1.959372737	18.99660055	0.151126714	15.15473086	15.51402643	16.1201444	17.31071712	18.99660055	21.28431023	22.90493747	24.23529442	26.70852876	28.7808843
162–162.99 months	−1.9610997	19.04811118	0.151176355	15.19549401	15.55572457	16.16344901	17.35729394	19.04811118	21.34317438	22.96953922	24.30497273	26.78861781	28.8707715
163–163.99 months	−1.963100496	19.09942105	0.151215094	15.23638853	15.59752218	16.20679934	17.40381205	19.09942105	21.40166456	23.03366421	24.37410579	26.8680813	28.96002256
164–164.99 months	−1.96537124	19.15051899	0.151243223	15.27740086	15.63940588	16.25018232	17.45025909	19.15051899	21.45977162	23.09730502	24.4426879	26.94691749	29.04864025
165–165.99 months	−1.967907983	19.20139397	0.151261042	15.31851726	15.68136213	16.2935848	17.4966227	19.20139397	21.51748666	23.16045458	24.51071375	27.02512521	29.13662805
166–166.99 months	−1.970706706	19.25203503	0.151268855	15.35972381	15.72337724	16.33699348	17.54289048	19.25203503	21.57480102	23.2231062	24.57817846	27.10270382	29.22399004
167–167.99 months	−1.973763307	19.30243131	0.151266974	15.40100642	15.76543738	16.38039498	17.58905003	19.30243131	21.63170632	23.28525349	24.64507758	27.17965324	29.31073101
168–168.99 months	−1.977073595	19.35257209	0.151255713	15.44235082	15.80752854	16.42377582	17.63508894	19.35257209	21.68819441	23.34689045	24.71140708	27.25597392	29.39685635
169–169.99 months	−1.980633277	19.40244671	0.151235395	15.48374254	15.84963659	16.46712239	17.68099474	19.40244671	21.74425743	23.40801143	24.77716335	27.33166687	29.48237214
170–170.99 months	−1.984437954	19.45204465	0.151206347	15.52516693	15.89174721	16.51042098	17.72675499	19.45204465	21.79988774	23.46861112	24.8423432	27.40673363	29.56728511
171–171.99 months	−1.988483106	19.50135548	0.151168902	15.56660919	15.93384595	16.55365778	17.7723572	19.50135548	21.855078	23.52868458	24.90694389	27.4811763	29.65160263
172–172.99 months	−1.992764085	19.55036888	0.151123398	15.60805429	15.97591819	16.59681886	17.81778887	19.55036888	21.90982109	23.5882272	24.97096308	27.55499753	29.73533271
173–173.99 months	−1.997276103	19.59907464	0.15107018	15.64948704	16.01794916	16.63989017	17.86303751	19.59907464	21.96411019	23.64723476	25.03439887	27.62820049	29.81848403
174–174.99 months	−2.002014224	19.64746266	0.151009595	15.69089206	16.05992392	16.68285759	17.90809056	19.64746266	22.01793871	23.70570337	25.09724977	27.70078892	29.90106591
175–175.99 months	−2.00697335	19.69552294	0.150942	15.73225378	16.10182739	16.72570683	17.95293549	19.69552294	22.07130033	23.76362952	25.15951476	27.77276709	29.9830883
176–176.99 months	−2.012148213	19.7432456	0.150867753	15.77355644	16.14364432	16.76842355	17.99755974	19.7432456	22.12418902	23.82101004	25.22119319	27.84413981	30.06456182
177–177.99 months	−2.017533363	19.79062086	0.150787221	15.8147841	16.1853593	16.81099326	18.04195071	19.79062086	22.17659899	23.87784214	25.28228489	27.91491246	30.14549772
178–178.99 months	−2.023123159	19.83763907	0.150700774	15.85592062	16.22695676	16.85340136	18.08609581	19.83763907	22.22852472	23.93412338	25.3427901	27.98509093	30.22590789
179–179.99 months	−2.028911755	19.88429066	0.150608788	15.89694967	16.26842096	16.89563315	18.12998242	19.88429066	22.27996095	23.98985168	25.40270949	28.05468167	30.30580486
180–180.99 months	−2.034893091	19.9305662	0.150511645	15.93785473	16.30973602	16.93767383	18.17359792	19.9305662	22.33090272	24.04502533	25.46204417	28.12369169	30.3852018
181–181.99 months	−2.041060881	19.97645636	0.150409731	15.97861909	16.35088587	16.97950845	18.21692964	19.97645636	22.3813453	24.09964299	25.52079568	28.19212851	30.46411251
182–182.99 months	−2.047408604	20.02195192	0.15030344	16.01922586	16.3918543	17.02112198	18.25996492	20.02195192	22.43128425	24.15370368	25.578966	28.26000023	30.54255145
183–183.99 months	−2.05392949	20.06704377	0.150193169	16.05965792	16.43262492	17.06249925	18.30269107	20.06704377	22.4807154	24.20720678	25.63655753	28.32731547	30.62053368
184–184.99 months	−2.060616513	20.11172291	0.150079322	16.09989799	16.47318119	17.10362501	18.34509539	20.11172291	22.52963484	24.26015204	25.69357313	28.3940834	30.69807493
185–185.99 months	−2.067462375	20.15598047	0.149962308	16.13992859	16.5135064	17.14448385	18.38716515	20.15598047	22.57803895	24.3125396	25.75001608	28.46031375	30.77519152
186–186.99 months	−2.074459502	20.19980767	0.14984254	16.17973203	16.55358366	17.18506029	18.42888762	20.19980767	22.62592435	24.36436993	25.80589011	28.52601678	30.85190042
187–187.99 months	−2.081600029	20.24319586	0.149720441	16.21929043	16.59339594	17.22533871	18.47025003	20.24319586	22.67328797	24.41564391	25.86119939	28.59120331	30.92821925
188–188.99 months	−2.088875793	20.28613648	0.149596434	16.25858573	16.63292602	17.26530336	18.5112396	20.28613648	22.72012699	24.46636278	25.91594853	28.6558847	31.00416621
189–189.99 months	−2.096278323	20.32862109	0.149470953	16.29759966	16.67215653	17.30493841	18.55184353	20.32862109	22.76643886	24.51652812	25.97014258	28.72007286	31.07976017
190–190.99 months	−2.103798828	20.37064138	0.149344433	16.33631375	16.71106993	17.34422789	18.592049	20.37064138	22.81222132	24.56614194	26.02378703	28.78378025	31.15502058
191–191.99 months	−2.111428194	20.41218911	0.149217319	16.37470935	16.74964852	17.38315572	18.63184317	20.41218911	22.85747235	24.61520657	26.07688783	28.84701989	31.22996756
192–192.99 months	−2.119156972	20.45325617	0.14909006	16.4127676	16.78787442	17.4217057	18.67121316	20.45325617	22.90219024	24.66372475	26.12945136	28.90980533	31.30462183
193–193.99 months	−2.126975375	20.49383457	0.14896311	16.45046946	16.82572959	17.4598615	18.7101461	20.49383457	22.94637354	24.71169957	26.18148447	28.97215071	31.37900471
194–194.99 months	−2.134873266	20.5339164	0.148836931	16.48779567	16.86319583	17.49760671	18.74862906	20.5339164	22.99002104	24.75913451	26.23299442	29.03407069	31.45313817
195–195.99 months	−2.142840157	20.57349387	0.148711989	16.52472682	16.90025476	17.53492476	18.78664912	20.57349387	23.03313184	24.80603342	26.28398896	29.0955805	31.5270448
196–196.99 months	−2.150865204	20.61255929	0.148588757	16.56124326	16.93688787	17.57179899	18.82419331	20.61255929	23.07570528	24.85240053	26.33447627	29.15669594	31.6007478

Table 24. *L, M,* and *S* parameters and selected smoothed percentiles for body mass index (BMI, kilograms/meters^2) by sex and age: 2 to 20 years—Con.

Sex and age	Percentile												
	L	*M*	*S*	3rd	5th	10th	25th	50th	75th	85th	90th	95th	97th
Girls—Con.													
197–197.99 months	−2.158937201	20.65110506	0.148467715	16.59732518	16.97307644	17.60821261	18.86124863	20.65110506	23.11774099	24.89824041	26.38446498	29.21743336	31.67427098
198–198.99 months	−2.167044578	20.6891237	0.148349348	16.63295257	17.00880162	17.64414872	18.89780209	20.6891237	23.15923885	24.94355805	26.43396418	29.27780966	31.74763877
199–199.99 months	−2.175176987	20.72660728	0.14823412	16.6681059	17.04404492	17.67959061	18.93384056	20.72660728	23.2001981	24.98835785	26.48298259	29.33784232	31.8208776
200–200.99 months	−2.183317362	20.76355011	0.148122614	16.70276277	17.07878553	17.71452019	18.96935117	20.76355011	23.24062188	25.03264836	26.53153263	29.39754939	31.89400908
201–201.99 months	−2.191457792	20.79994337	0.148015249	16.73690461	17.11300574	17.74892115	19.00432062	20.79994337	23.28050814	25.07643282	26.57962232	29.45694948	31.96706354
202–202.99 months	−2.199583649	20.83578051	0.147912564	16.77050999	17.14668547	17.78277581	19.03873583	20.83578051	23.31985872	25.11971866	26.62726338	29.51606178	32.04006655
203–203.99 months	−2.207681525	20.87105449	0.147815078	16.80355796	17.17980508	17.81606667	19.07258364	20.87105449	23.35867482	25.16251271	26.67446717	29.57490604	32.11304561
204–204.99 months	−2.215737645	20.90575839	0.147723315	16.83602739	17.21234472	17.8487761	19.10585083	20.90575839	23.39695789	25.20482218	26.7212455	29.63350259	32.18602887
205–205.99 months	−2.223739902	20.93988477	0.147637768	16.86789789	17.24428517	17.88088689	19.13852417	20.93988477	23.43470854	25.24665348	26.76760965	29.69187236	32.25904682
206–206.99 months	−2.231667995	20.97342858	0.147559083	16.89914528	17.27560407	17.91237975	19.1705904	20.97342858	23.4719319	25.28801794	26.81357526	29.75003682	32.33212376
207–207.99 months	−2.239511942	21.00638171	0.147487716	16.92975012	17.30628297	17.9432379	19.20203617	21.00638171	23.50862756	25.32892108	26.85915312	29.80801808	32.40529387
208–208.99 months	−2.247257081	21.0387374	0.14742421	16.95969079	17.33630159	17.97344339	19.23284815	21.0387374	23.54479768	25.3693713	26.90435663	29.8658388	32.47858818
209–209.99 months	−2.254885145	21.07048996	0.147369174	16.98894397	17.36563825	18.00297732	19.26301292	21.07048996	23.58044651	25.40937929	26.94920132	29.92352223	32.55203545
210–210.99 months	−2.26238209	21.10163241	0.147323144	17.01748828	17.39427286	18.03182181	19.29251705	21.10163241	23.61557603	25.44895346	26.9937009	29.98109225	32.62566902
211–211.99 months	−2.269731517	21.13215845	0.147286698	17.0453012	17.42218439	18.05995835	19.32134706	21.13215845	23.65018962	25.48810377	27.03787056	30.03857329	32.69952105
212–212.99 months	−2.276917229	21.16206171	0.147260415	17.07236026	17.44935184	18.08736842	19.34948942	21.16206171	23.68429059	25.52684029	27.08172575	30.09599042	32.77362474
213–213.99 months	−2.283925442	21.1913351	0.147244828	17.09864412	17.47575509	18.11403409	19.37693055	21.1913351	23.71788103	25.56517184	27.12528094	30.15336926	32.84801632
214–214.99 months	−2.290731442	21.21997472	0.147240683	17.12412619	17.50136974	18.13993458	19.4036568	21.21997472	23.75096919	25.603114	27.16855668	30.21073618	32.92272296
215–215.99 months	−2.29732427	21.24797262	0.147248467	17.14878634	17.52617667	18.16505254	19.4296545	21.24797262	23.78355579	25.64067435	27.21156668	30.26811799	32.9977851
216–216.99 months	−2.303687802	21.27532239	0.14726877	17.17260194	17.55015468	18.18936927	19.45490996	21.27532239	23.81564452	25.67786376	27.25432769	30.32554216	33.07323931
217–217.99 months	−2.309799971	21.30201933	0.147302299	17.19554744	17.57328018	18.21286444	19.47940934	21.30201933	23.84724252	25.714697	27.29685999	30.38303689	33.14911749
218–218.99 months	−2.315651874	21.32805489	0.147349514	17.21760352	17.59553468	18.23552108	19.50313889	21.32805489	23.8783497	25.75118107	27.33917721	30.44063073	33.22546443
219–219.99 months	−2.32121731	21.35342563	0.147411215	17.23874246	17.61689275	18.25731763	19.52608462	21.35342563	23.90897582	25.7873338	27.38130268	30.49835324	33.30230965
220–220.99 months	−2.326481911	21.37812462	0.147487979	17.25894211	17.63733356	18.27823552	19.54823263	21.37812462	23.93912415	25.82316611	27.42325378	30.55623433	33.37969431
221–221.99 months	−2.331428139	21.40214589	0.147580453	17.2781787	17.6568349	18.29825524	19.5695689	21.40214589	23.96879993	25.85869115	27.46505002	30.61430463	33.45765732
222–222.99 months	−2.336038473	21.42548351	0.147689289	17.29642829	17.67537444	18.31735722	19.59007937	21.42548351	23.99800858	25.89392241	27.50671138	30.67259539	33.53623826
223–223.99 months	−2.34029545	21.44813156	0.14781515	17.31366688	17.69292976	18.33552175	19.60974989	21.44813156	24.02675569	25.92887369	27.54825824	30.73113849	33.61547736
224–224.99 months	−2.344181703	21.47008412	0.147958706	17.32987032	17.70947829	18.35272903	19.62856629	21.47008412	24.05504702	25.96355908	27.58971144	30.78996648	33.69541553
225–225.99 months	−2.34768	21.49133529	0.148120633	17.34501435	17.72499741	18.36895919	19.64651429	21.49133529	24.08288851	25.99799301	27.63109226	30.84911253	33.77609435
226–226.99 months	−2.350773286	21.51187918	0.148301619	17.35907462	17.73946435	18.38419225	19.66357958	21.51187918	24.11028624	26.03219019	27.67242239	30.90861047	33.8575561
227–227.99 months	−2.353444725	21.53170989	0.148502355	17.37202667	17.75285625	18.39840811	19.67974776	21.53170989	24.13724646	26.06616563	27.71372396	30.96849476	33.93984372
228–228.99 months	−2.355677743	21.55082155	0.148723546	17.38384594	17.76515018	18.41158663	19.69500438	21.55082155	24.16377555	26.09993465	27.75501954	31.02880054	34.02300086
229–229.99 months	−2.35745607	21.56920824	0.148965902	17.39450778	17.77632308	18.42370753	19.70933491	21.56920824	24.18988006	26.13351285	27.7963321	31.08956357	34.10707184
230–230.99 months	−2.358763788	21.58686406	0.149230142	17.40398745	17.78635182	18.43475047	19.72272474	21.58686406	24.21556667	26.16691611	27.83768505	31.1508203	34.1921017
231–231.99 months	−2.359585369	21.60378309	0.149516994	17.41226013	17.79521318	18.44469501	19.73515921	21.60378309	24.24084219	26.20016061	27.87910223	31.21260782	34.27813617
232–232.99 months	−2.359905726	21.61995939	0.149827195	17.41930091	17.80288385	18.45352064	19.74662357	21.61995939	24.26571357	26.23326279	27.92060786	31.27496389	34.3652217
233–233.99 months	−2.359710258	21.635387	0.150161492	17.42508482	17.80934044	18.46120675	19.757103	21.635387	24.29018788	26.26623937	27.9622266	31.33792691	34.45340544
234–234.99 months	−2.358980464	21.65006126	0.150520734	17.42958448	17.81455755	18.46773133	19.76658246	21.65006126	24.31427499	26.29911039	28.00398629	31.40153631	34.54273066
235–235.99 months	−2.357714508	21.6639727	0.150905439	17.43278087	17.81851675	18.47307706	19.77504736	21.6639727	24.33797514	26.33188509	28.04590512	31.46583097	34.6332581
236–236.99 months	−2.355892424	21.67711736	0.151316531	17.43464513	17.82119134	18.47722102	19.78248242	21.67711736	24.3613	26.36458581	28.08801335	31.53085181	34.72502979
237–237.99 months	−2.353501353	21.68948935	0.151754808	17.43515168	17.82255737	18.48014209	19.78887249	21.68948935	24.3842575	26.39723077	28.13033767	31.59663995	34.81809511
238–238.99 months	−2.350528726	21.70108288	0.152221086	17.43427465	17.8225906	18.48181892	19.79420232	21.70108288	24.40685591	26.42983873	28.17290543	31.66323724	34.91250374
239–239.99 months	−2.346962247	21.71189225	0.152716206	17.43198786	17.82126653	18.48222995	19.79845655	21.71189225	24.42910393	26.4624291	28.21574476	31.73068625	35.00830552

Appendix I. Description of Growth Chart Workshops

A series of four workshops that dealt with topics germane to the growth chart revision were sponsored by the Division of Health Examination Statistics at National Center for Health Statistics. Selected highlights of these workshops are described below. Workshops 1, 3, and 4 were co-chaired by Dr. Robert Kuczmarski and Dr. Alexander Roche. Workshop 2 was chaired by Dr. John Himes.

Workshop 1

In December 1992, NCHS sponsored the first workshop to address a number of concerns that had been identified about the1977 NCHS Growth Charts and to solicit recommendations on approaches that could be taken in the revision process. A group of experts from various Federal agencies and academic institutions (table I) addressed the following questions:

- How and when should the 1977 NCHS Growth Charts be updated with NHANES II and NHANES III data?
- Should ethnic-specific charts be created, perhaps at least for white non-Hispanic and black non-Hispanic populations and Mexican Americans, if adequate sample sizes were available?
- Should growth patterns and sexual maturity data be incorporated in the revised growth charts?
- What data should be used to develop charts for the age range birth to 3 months where NHANES III data were insufficient?
- What curve smoothing procedures should be considered and used?
- Should the curves be constructed only for the measures in the 1977 charts or should different measures be considered?

Table I. Participants in the NCHS growth chart workshops

Name and affiliation at time of the workshop	Workshop attended (See notes)
Ronette R. Briefel, Dr.P.H. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	1, 3, 4
Nancy F. Butte, Ph.D. Pediatrics Department Baylor College of Medicine Houston, TX	1, 3, 4
Patrick H. Casey, M.D. Arkansas Children's Hospital University of Arkansas for Medical Sciences Little Rock, AK	3
Lester R. Curtin, Ph.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	1, 2, 4
Robert Earl, M.P.H. Institute of Medicine National Academy of Sciences Washington, D.C.	3
Frank Falkner, M.D. Department of Pediatrics University of California, Berkeley Berkeley, CA	4
Katherine M. Flegal, Ph.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3, 4
Samuel J. Fomon, M.D. Department of Pediatrics University of Iowa Iowa City, IA	1, 3
Deborah A. Frank, M.D. Child Development Unit Boston City Hospital Boston, MA	3
Debra A. Galuska, Ph.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Gilman Grave, M.D. National Institute of Child Health and Human Development National Institutes of Health Bethesda, MD	1
Lawrence Grummer-Strawn, Ph.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Shumei Guo, Ph.D. Division of Human Biology Wright State University Yellow Springs, OH	1, 4
Maureen Hack, M.D. Rainbow Babies and Children's Hospital University Hospitals of Cleveland Cleveland, OH	3
James Hansen, M.D. Neonatology and Pharmacology Mead Johnson Nutrition Division Evansville, IN	3
John H. Himes, Ph.D. Division of Epidemiology University of Minnesota Minneapolis, MN	1, 2, 4
Jay Hirschman, M.P.H. Food and Nutrition Service U.S. Department of Agriculture Alexandria, VA	3

- Should electronic formats be considered and developed or should there be a continued reliance on paper and pencil formats?

This workshop successfully dealt with many of these issues and provided a framework for the overall revision process. It became clear in the course of discussions, however, that additional topics would require further attention. These are discussed below. The deliberations at this workshop have been summarized (16).

Workshop 2

One topic from the first workshop that required additional discussion was the source of data to be used from birth to age 3 months. Consequently, a second dedicated workshop was held to discuss the feasibility and describe the potential design of an ancillary research project to collect early infancy growth data (table I). At this workshop characteristics of a special infant study were identified, and included the following:

- The design should be a cross-sectional, multicenter, hospital-based study with six sites, each including a single cooperating hospital with at least 3,000 births annually.
- Infants should be selected to reflect the national variation in socioeconomic status and ethnicity and measured at a central data collection center at each site from age 1 to 24 weeks.
- The target sample should consist of 500 healthy infants without physical limitations at each site, for a total sample of 3,000 infants.
- Data collected should include weight, recumbent length, head circumference, feeding history (breast, formula, etc.), and participation in public assistance programs, in addition to information detailed on the U.S. Standard Certificate of Live Birth.

This study would have been the most desirable option to fill in the data gaps for ages in early infancy. However,

Table I. Participants in the NCHS growth chart workshops—Continued

Name and affiliation at time of the workshop	Workshop attended (See notes)
Clifford L. Johnson, M.S.P.H. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	1, 2, 3, 4
Francis Johnston, Ph.D. Department of Anthropology University of Pennsylvania Philadelphia, PA	1
John L. Kiely, Ph.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3
Robert J. Kuczmarski, Dr.P.H. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	1, 2, 3, 4
Robert M. Malina, Ph.D. (1) Department of Kinesiology and Health Education University of Texas at Austin Austin, TX (4) Institute for the Study of Youth Sports Michigan State University East Lansing, MI	1, 4
Joyce A. Martin, M.P.H. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3
Reynaldo Martorell, Ph.D. Division of Nutritional Sciences Cornell University Ithaca, NY	1
Thomas McLemore National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	2
Zuguo Mei, M.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
William M. Moore, M.D. Medical Services Ross Products, Division of Abbott Laboratories Columbus, OH	3
Robert S. Murphy, M.S.P.H. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	1, 3, 4
Cynthia L. Ogden, Ph.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3, 4
Mary D. Overpeck, Dr.P.H. National Institute for Child Health and Human Development National Institutes of Health Bethesda, MD	3, 4
Ibrahim Parvanta, M.S. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Geraldine Perry, Dr.P.H. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Alexander F. Roche, M.D. Division of Human Biology Wright State University Yellow Springs, OH	1, 2, 3, 4

the cost of this project was estimated at $1.3 million in 1994, and it was not possible to locate the resources necessary to proceed.

Workshop 3

Another topic identified in the first workshop was the issue of whether low birthweight infants should be included in the revised growth charts for the United States. Therefore, a third workshop was held in which experts with clinical and public health experience in low birthweight participated (table I). A summary of this workshop is available (84). Some key points in favor of excluding low birthweight infants (<2,500 gm) are as follows:

- Preterm low birthweight (LBW; 1,500–2,500 gm) and very low birthweight (VLBW; <1,500 gm) infants differ in growth status from term infants of normal birthweight, even after chronological ages are adjusted for gestational age.
- VLBW infants might still be hospitalized at 2–3 months and would not be included in the NHANES III sample.
- Separate LBW and VLBW charts already exist, such as those of the Infant Health and Development Program (IHDP).
- Clinicians would be able to select appropriate charts confidently because maternal recall of birthweight is generally accurate.

The major considerations in favor of retaining the LBW infants in the revised charts included the following:

- The IHDP charts were developed for preterm LBW infants. National natality data indicated that about 49 percent of babies born <2,500 gm are not preterm and more than 50 percent of infants born between 2000–2,500 gm are not preterm.
- Many users may not be familiar with specialized charts such as the IHDP charts, and which may not be readily available.
- Excluding infants with birthweights <2,500 gm would tend to make the revised charts more of a standard and less of a reference.
- Excluding at the 2,500 gm level would leave out approximately 7.5 percent of all children and approximately 15 percent of all black infants born in the United States for whom the general, revised NCHS charts would not be applicable.

Subsequently, the final decision was to exclude only VLBW infants. For these children, specialized charts, such as the IHDP charts are available from birth to 3 years (71–73,85). The rationale is that at this level (<1,500 gm), virtually all children are preterm, their growth is markedly different from the growth of higher birthweight, term infants, and less than 1 percent of all children born in the United States would be excluded.

Table I. Participants in the NCHS growth chart workshops—Continued

Name and affiliation at time of the workshop	Workshop attended (See notes)
Alan Rogol, M.D. Division of Endocrinology & Metabolism University of Virginia Charlottesville, VA	1
Kelley Scanlon, Ph.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Paula Scariati, Ph.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
Kenneth C. Schoendorf, M.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3
Betty Lou Sherry, Ph.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	4
E. O'Brian Smith, Ph.D. Pediatrics Department Baylor College of Medicine Houston, TX	1
Richard F. Troiano, Ph.D. National Center for Health Statistics Centers for Disease Control and Prevention Hyattsville, MD	3, 4
Frederick Trowbridge, M.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	1, 2
Linda Wright, M.D. National Institute for Child Health and Human Development National Institutes of Health Bethesda, MD	3
Ray Yip, M.D. National Center for Chronic Disease Prevention and Health Promotion Centers for Disease Control and Prevention Atlanta, GA	1, 2

NOTES: 1 = Workshop 1. NCHS growth chart workshop, December 13–15, 1992.
2 = Workshop 2. Workshop to consider the feasibility of a multicenter study to collect data on growth of infants for revision of the NCHS Growth Charts, February 10, 1994.
3 = Workshop 3. NCHS workshop to consider low birthweight in relation to the revision of the NCHS Growth Charts for infancy (birth–3 years), October 4–5, 1994.
4 = Workshop 4. Workshop to consider secular trends and possible pooling of data in relation to the revision of the NCHS Growth Charts, November 14–15, 1995.

Workshop 4

Analyses of NHANES III data indicated that an increasing trend in body weight was occurring among children, adolescents, and adults in the United States between the time of the NHANES II and NHANES III surveys (86–89). Consequently, a fourth workshop focused on the implications of this secular trend in body weight for the growth charts (table I). The alternative

methods for pooling multiple data sets were also considered during the course of this meeting. A summary of this workshop is available (90).

A review of the data indicated there was an increase in weight that was most pronounced at the upper percentiles of the distribution for males and females (91). Ultimately, it was important to know how including the NHANES III subjects in the pooled sample would influence the weight and BMI curves. If including heavier subjects from NHANES III in the combined data set from the five surveys elevated the percentiles to a substantially higher level, one option would be to exclude the NHANES III data. When NHANES III data were included, there was an effect on the higher percentile curves that became consistent at about 6 years of age. Using information discussed at this workshop, a decision was subsequently made to exclude the NHANES III weight and BMI data for ages 6 years and over from the revised growth charts.

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